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MARCH, 1936

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THE AMERICAN ENGINEER

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THE ENGINEER'S RESPONSIBILITIES

A Series on Conditions and Opportunities Which Confront the Profession

To be Presented in the American Engineer
By the President of N. S. P. E.

Beginning with this issue, there will appear, from time to time, articles dealing with the conditions, problems, opportunities and obligations confronting the engineer as a member of a profession indispensable to the welfare of society.

These articles will be in serial form and will be from the pen of President D. B. Steinman of the National Society of Professional Engineers.

No person in America, and probably none in the world, is more competent, more inspired or more qualified by experience, to discuss the topics to be presented than is Engineer Steinman. Despite a career of accomplishment that has earned for him international distinction as a creator of bridges, he has for more than twenty years played a leading role in arousing the engineer to a sense of appreciation for his own contributions to civilization and of his responsibilities as a member of society.

It is believed that these articles will aid materially in the creation of new state professional societies, in promoting engineering legislation and in consolidating the engineering profession through the medium of the one and only organization so constituted and so dedicated as to make the same possible; viz, the National Society of Professional Engineers.

The first installment follows:

What is Wrong with the Engineering Profession?

By
D. B. STEINMAN

1. Organization

THE best way to realize our deficiencies—"to see ourselves as others see us,"—is by comparison with other professions.

For solidarity, standing, strength, and service, the most effective of all professional organizations is the American Medical Association. Its present membership is 100,544—and none but licensed physicians are admitted. Every member of a state medical society is automatically a member of the American Medical Association.

The engineering profession has no society of comparable strength. Instead of establishing one powerful organization for all engineers, our profession has ninety national engineering societies! We have successively split, separated, divided and subdivided our profession into technical branches, subdivisions, and specialties, and we have formed separate technical societies for the various groups and divisions. Instead of following the principle of uniting all engineers, the technical societies are organized on the basis of dividing the profession. Instead of placing the emphasis on the common interests of all engineers, the emphasis is placed on the differences that divide.

Our profession has separate national organizations for the manifold branches and specialties into which it has allowed itself to be divided—one or more for nearly every letter of the alphabet. Under the letter A, we have societies of automotive engineers, aeronautic engineers, and agricultural engineers; under C, we have societies of ceramic engineers, chemical engineers, consulting engineers, and civil engineers; under the letter M, we have national societies of marine engineers, management engineers, military engineers, mechanical engineers, municipal engineers, mining and metallurgical engineers, and motion picture engineers; and so on through the alphabet.

No other profession has been so stupid as to break itself up into ninety divisions or branches with separate national organizations for each!

This division into separate organizations with divergent interests, background, and viewpoint, prevents effective united effort for the interests of the profession as a whole.

Other professions have their branches and specialties. Lawyers follow manifold specialties, but they have only one American Bar Association. The medical profession has over 200 specialties, one for every organ of the human body, but the American Medical Association unites them all.

If there is any wisdom in the collective minds of the engineers of the country, we will profit by these examples.

What is the remedy?

The engineering profession needs a nationwide organization devoted to the common interests and aspirations of all engineers.

That is why the National Society of Professional Engineers has been organized. It is not another "Engi-

(Continued on page 25)

SCIENCE AND REALITY

The Search for Truth Continues

Fundamental Concepts in State of Flux
Man Still Uninitiated into Nature's Secrets

By
LEOPOLD LEITNER

SIR Arthur Eddington, in his work "The Nature of the Physical World," characterizes the external world of physics as a world of shadows. "In the world of physics we watch a shadowgraph performance of the drama of familiar life . . . . It is all symbolic, and as a symbol the physicist leaves it. Then comes the alchemist Mind which transmutes the symbols. The sparsely spread nuclei of electric force become a tangible solid; their restless agitation becomes the warmth of summer; the octave of ethereal vibrations becomes a gorgeous rainbow."

The relationship of this symbolic science to the corresponding physical picture has undergone a change in the course of time. Until about a generation ago the symbols were, so to speak, more "tangible." The symbolic world of Newton, the scientist, could be easily transmuted into the everyday physical world of Newton, the man. Since the introduction of relativity and the quantum theory this is no longer so. Great changes in science have always occurred when the alchemist Mind was questioned as to whether it was justified in painting the picture in the manner it did.

This everyday physical picture of the world has played an important part in the evolution of science. We can venture to say that without it science would not have been possible. The symbols and the shadowgraph are the result of many full-color paintings, with the colors carefully removed until nothing but a fine tracery is left. How could it be otherwise? Were the philosopher's ideal realized, we would have to surround his mind with an impenetrable bubble and relegate it to the outer darkness so that he might concoct his scheme of things undisturbed by the noise and bustle of the universe. But what would be the result? Probably a collection of smaller bubbles. It would not be science.

We attach great poetic beauty to the flight of Daedalus and Icarus and discover a moral lesson in the fate of the son who, unmindful of his father's warning, came too near to the sun and perished, but we also read of the Phoenicians who, on a very prosaic, mercenary enterprise, sailing south on the western shore of Africa and finding the sun getting hotter and hotter, considered it advisable to turn their ships homeward before the sun could dry up the ocean beneath them. These both were very primitive pictures of the alchemist Mind; they were, however, soon vastly improved by the great Greek thinkers. As a matter of fact, we may say that some prominent Greeks overshot the mark, even to our minds, which have admittedly been developed to a high state of comprehension although somewhat befuddled by certain aspects of modern scientific thought. To illustrate this, we have only to mention Pythagoras and his assertion that nothing exists but numbers. To pass judgment on this is clearly beyond the pale of science. We leave it, together with the question as to whether Pythagoras meant only whole numbers or all numbers, including irrationals, made famous by his own theorem, to those who concern themselves with ontology. But questions of a similarly obscure nature we shall have to face in connection with modern scientific thought. We might well note here one Greek scientist whose book, though written 300 years before Christ, we still study in our schools, and one of whose axioms holds the record for starting an argument which lasted for two thousand years.

It is difficult to say, at this time, whether Euclid, in building up his geometry, arrived at a system of formal logic, or something which primarily referred to space. We are inclined to think that, like unto ourselves, being able to feel only a limited amount of space with his boots, and using "intuition" for whatever was beyond that, he intended to give a comprehensive treatise on what we term geometry. Geometry as of a method of reasoning suggests a system that uses geometrical concepts only as the bearers, so to speak, of concepts in general. In this light a point, or a line, is just a name. It may, for example, mean a dollar in a problem of arithmetic.

The famous long-disputed argument, of which the author is Euclid, is the so-called parallel-line axiom: given a straight line and a point outside of it, the axiom states, one and only one straight line can be drawn through that point, parallel to the given line. It is said that from the beginning this axiom was looked upon with suspicion. Was it an axiom? Could it be proven from other axioms? In a consistent science we must have the required number of axioms, but no more, otherwise contradictions may arise. The best minds have tried to prove the parallel-line axiom from the others and failed, for the obvious reason, as it finally turned out, that it could not be proven. The negative proof came in an indirect way: by the discovery of non-Euclidean geometry. We are not concerned here directly with non-Euclidean geometry, only insofar as it crops up in the world-picture of modern physical science.

Hyperbolic geometry denies Euclid's parallel-line axiom. Its corresponding axiom states that through the said point at least two straight lines can be drawn parallel to the given straight line. As to the remainder of Euclid's axioms, it accepts them all. This new geometry furnished, first of all, the proof that Euclid's parallel-line axiom did not depend on other axioms. They were accepted, but the parallel-line axiom was denied. It did more than that: it opened up new vistas in the processes of logic. Obviously, there must be a method of attack in developing any system of thought. It has been mentioned that Euclid probably first thought of his geometry as something dealing with space. However, that is immaterial. Even if he had had primarily in mind a formal system of logic, he could still have

used his concept of space (and ours, incidentally) to help him build up that system. Had he not done so, he would not have gone far. From his "intuitive" knowledge of space (if we may use the term), he knew just about what axioms to set up. Had he set up some other abstract system, he probably would never have finished his geometry. But now we stand before a new geometry which contradicts one of the "communes animi conceptiones," one of those "self-evident truths." Certainly, nobody ever drew those "at least two" parallel lines which the new geometry postulates through that point. The fact is that this statement must be taken in a formal way. This means that there is a group of axioms which has a one-to-one correspondence with all of Euclid's axioms except that on parallel lines. This group permits the addition of another axiom that contradicts that of parallel lines. But here comes the alchemist mind. It wishes to see a picture—a geometrical picture. We must satisfy this mind lest we appear to be dealing with soap bubbles. We draw a circle; all points of Euclid's geometry are points within the circle; the straight lines of Euclid's geometry are the chords of that circle; Euclid's distances are those between points within that circle. But here is the rub—these distances are termed equal only if they form equal double ratios (we have to fall back on projective geometry) with the end-points of the chords on which they lie. Starting out with these premises, and keeping in mind Euclidean geometry, we arrive at an axiom which corresponds to Euclid's parallel-line axiom. Mindful of our premises, we find that we can, as a matter of fact, draw an infinite number of parallel lines to a given line through a given point—in a formal way, to be sure. We formally humble ourselves and state that we can draw at least two parallel lines through the said point.

Too many words have been perhaps wasted on what we mean by this "formal-logical" interpretation. Swann, in his "Architecture of the Universe" has an ingenious way of conveying the idea with few words. He says, in effect: The mathematician glories in the fact that his symbols do not mean anything. When we discuss some metaphysical thoughts arising from modern science, we shall have to refer back to this. We wish to point out in advance that, since mathematical formulas do not mean anything in particular, we must not expect to get more out than we put into them. A hypothesis poured into the mathematical mill does not come out as proven facts. If we place into it time upside down, it will return upside down.

Geometry, dealing as it does with our concept of space, seems more "tangible" than the rest of mathematics. (It might be mentioned here, that there are several non-Euclidean geometries.—Riemannian geometry has an axiom according to which it is not possible to draw a straight line through a point, parallel to another straight line). The question naturally arises, is space Euclidean or non-Euclidean. In other words, which is "real" geometry? Here mathematics disappoints us: it does not give an answer. Mathematicians have grown wary of the ways of the world. They have learned by the experiences of two thousand years not to burn their bridges behind them. There was a time when they considered their axioms self-evident truths. These same axioms, as the faculties of critics grew more acute, became empirical truths. They eventually ceased to be truths at all; they became assumptions. It is "assumed" that one and only one line can be drawn parallel to another line through a point—or otherwise, as the case may be. The mathematician will not commit himself. The physicist carries the brunt of the inquisitive world. It is rightly so. The physicist looks toward the mathematician for a faultless train of thought. He himself supplies the physical premises and withdraws the physical conclusions.

If we were to characterize the main strides of physical science, the same could perhaps be accomplished by enumerating the questions which men have raised about obvious things. We can pass over lightly Helios and his chariot, devils, witches riding the waves in tubs and beleaguering helpless ships, although at one time such ideas were sufficiently apparent. They were incalculable. However, for good or evil, they kept the world going. Men started to calculate in spite of them. For example, it seemed obvious to anybody that a heavier body should fall faster than a lighter one; that is, it did until a young man by the name of Galileo tried it out from the leaning tower of Pisa. It also appeared quite natural that the universe should turn around the earth, until Copernicus questioned it. Especially, it was apparent that an apple should fall from a tree. The most remarkable mind that the world has perhaps ever produced, however, saw something peculiar even about that.

If it is permissible to draw a parallel between the development of scientific concepts in the individual and in the race, it is rather interesting to observe how quickly we change the "solid" pictures of our concepts. Of course, they are always pictures. We must not investigate them too critically, else they melt away before our eyes, as indeed even the solid rock becomes so much solid emptiness under the scrutiny of modern thought. To a boy growing up in the mountains, the world about appears as though closing in on him and perhaps he experiences the same sensations as a man at the bottom of a crater. Being told the world is round, he is quite reconciled to his observations. The world is to him like a hollow ball on the inside of which we live. The space problem is settled. Under feet is the earth, a distance down perhaps hell. The boy gets a profound shock as he sees the first atlas and in it a picture of the earth, round all right, but just the other way from which he had expected. What puzzles him mainly, since he finds himself living on the outside instead of the inside of a revolving ball, is that he does not get swept off into the bottomless abyss. He needs must look for more data to form for himself a tolerably complete picture. He acquires the concept of "down"—to the center of the earth—and of weight. The picture is not as self-satisfying as the original one was, but he has set out to answer new problems as they arise. In the back of his mind there is a lingering puzzle of an infinite space. Some day, perhaps, he will hear of finite but unbounded space. This does not mean much to his mental eyes, but he will perhaps be satisfied that there is a mathematical entity which, in physical terms, means this kind of space. He finds that his first picture was not so bad. He may have amassed many details, but, above all, he will realize the hopelessness of forming a perfect physical picture.

Returning from this sketchy development of the individual to that of the race, we may state that the first picture of the universe, though naive, answered the purpose. Angels and demons were performing offices which we could not fathom otherwise. It was well justified. We populated the world with beings in many respects not unlike ourselves, with aims, as should be in a world of purpose. Then the Galileos and the Newtons started to inquire and answered their inquiries with

such exactness that a new world was created, a world in which forces, energy and work took the place of angels and demons, a world not as purposeful as the one before. It was, as a matter of fact fatalistic—but more exact. Eventually this second world, by its own conclusions, being unable to answer for them, gave way to a third, a mathematical world. The alchemist Mind followed the second world to its end. It has failed us in the third. To be sure, it paints us pictures of even the third world, but the pictures seem queer—they sometimes seem upside down.

In analyzing the present status of physical science, we must first of all bear in mind the basic principles of all scientific thinking, the postulate of cosmic connectedness and the principle of the uniformity of nature. Whatever the scheme of nature is, if there be any at all, we wish to approach it with one of our own. We find, however, in classifying all experimental data, that we have to make the approach from two avenues—the avenue of classical determinateness and the avenue of chance. Granted even the possibility that there is determinateness at the bottom of what we can approach only with the theory of probability, there seems to be an inherent difficulty in bridging the gap between what we may call molecular phenomena and mass phenomena. We have from classical physics the principle of conservation of energy and the principle of conservation of momentum. Somehow they are different for molecules single and for molecules in mass. Gas molecules, in a closed vessel, if no heat is added or subtracted, keep on shooting to and fro without end. When they move in a mass in a pipe, however—in other words, when they have a wind velocity besides the kinetic velocity—the wind velocity can be kept up only if we have a falling gradient. Of course, the energy is not lost—it is transformed into heat—a more violent vibration of the molecules (for this is the way the molecules themselves feel about it). The whole thing boils down to the proposition that: to keep the gas molecules going in a mass, we must increase the violence of their vibrations. This, we must admit, presents to us a somewhat different picture from gas flowing in a pipe with a falling gradient. We cannot comprehend the connection between the whole and its parts. We cannot explain why, as *Punch* remarks, when one end of a man is stepped upon, the other end shouts.

There are two figments of our imagination which are responsible for the locomotion of energy from one place to another. We are familiar with them in every day life; we carry their idealized shapes across to science to do the work that is expected of them; they are the particle and the wave. As could be expected of a transfer from one realm to another, we can explain certain phenomena only by means of the one, the rest by means of the other. The particle and wave have, however, in recent times lost their entire personality until practically nothing but their names are left. The particle, the quantum, is even expressed in terms of the wave. At this stage we cease to form a picture. At best we can imagine an amount of haziness rushing through space, an amount, to quote Eddington, large enough to spread over the objective of the largest telescope, and small enough to crowd into an electron. But even so, it cannot be imagined as causing interference. For this office we must transform it into a wave.

The Bohr atom-model served a very useful purpose by helping us to explain many atomic phenomena. The trouble was, we soon forgot it was only a model. There is no such actual picture of the atom. It is apparent, first of all, that even if it existed, we could never get a hold of it. We are dealing here with energy quantities caused by changes in the atom. When there occurs no change in the atom, the atom cannot be noticed; when it can be noticed a change is *occurring*. We are at loss to catch it in stable equilibrium. But there is an even weightier reason for our inability to have a picture of the atom. In a material sense there is nothing to picture. If this were not so, we would have to draw absurd conclusions, as indeed some men unwittingly have done. Let us suppose there were bodily electrons, little globules of negative electricity. Like charges repel each other—the electron could not hold together by electrical forces alone—there would have to be "material" forces present to hold the electron together; "matter" would then necessarily be present—and we have arrived at the starting point, "matter," of which the smallest part is supposed to be the atom. The objector to this argument must give a valid reason for the real existence of the planetary-system atom, a more cogent reason than just to have something by means of which to explain atomic phenomena. As a matter of fact, the atom is no longer visualized as a planetary system; the atom is supposed to be a cloudiness around the nucleus, with condensations in that cloudiness, the condensations meaning the most probable locations of the electrons.

We shall now try to draw a dividing line between what may be called the realm of reality and that of science.

We are looking at the world in two ways: as creatures with practical minds crawling on the surface of the earth, kicking against rocks and finding them solid; and as critical scientific minds, weighing this same solidity on the balance of reason and finding it wanting. As critical minds we are looking for a self-consistent single system, but are unable to actually find one. We have to apply two systems, the modified classical system, based ultimately on cause and effect, and the system which has its origin in the quantum theory, involving the laws of chance. As practical minds, whether we like to admit it or not, we are thinking only in terms of cause and effect: we postulate a connectedness among the happenings and objects of the world. This means that we are not satisfied with mere sequences of happenings, but demand causes and effects.

What is then reality? This question, by its very nature, can be directed only to the practical mind; the critical one will be unconcerned. The practical mind will answer: reality is that which we are used to. Time? Surely. Space? Equally so—and most certainly Euclidean. We are willing to change over to finite but unbounded non-Euclidean space the moment it becomes more than a mathematical expression. Force, power, work, energy become real the minute they become tools in our mental hands.

We write—finis—to reality when a yellow blotch on a derby suddenly gathers itself up and flies in the form of an egg into the hands of a mischievous onlooker of a parade. We know that the egg should fly from the onlooker toward the object of his disgust and end up as a yellow blotch on the derby. We must likewise deny reality to a world where things happen by chance. We must deny reality to all PICTURES which look queer to our practical minds, even though they are the exact counterparts of the mathematical concept of nature. We should have to think this statement over twice, if

(*Continued on page* 25)

INTERSTATE PRACTICE

As Viewed By Architects

Interesting Opinions and Proposals
As Set Forth By
The National Council of Architectural Registration Boards

INTERSTATE PRACTICE

1. Interstate practice may be the privilege and is certainly the ambition of every architect. When the opportunity comes to an architect to secure a commission in a State in which he is not registered, his first thought is how to secure registration in that State as quickly as possible at a minimum of expense. It was for the purpose of facilitating reciprocal registration among the States having laws regulating the practice of architecture, and of securing greater uniformity in the requirements for registration in all States that the National Council of Architectural Registration Boards was organized.

2. Architectural Registration is Personal. Each individual whose name appears before or above the professional title "Architect" must be registered as an architect in every State in which he does business. Individuals or members of firms practicing without registration in States where there are registration laws are definitely law-breakers, subject to the several penalties prescribed by law.

3. Corporations are impersonal; they have an existence apart from the personnel composing them, and can not be examined as to personal qualifications nor be subject to the pains and penalties of imprisonment or capital punishment. Therefore, corporations are constitutionally incapable of assuming the obligations incident to professional practice. Corporations may act as agents for professional men, but may not be allowed to practice architecture or any other profession, nor lawfully use a registered professional title in connection with a corporate name.

These statements are supported on the grounds of public benefit because the purpose of professional registration is to protect the public by first establishing proof of the competency of the individual, and then placing responsibility upon him in an inescapable way.

By contrast, corporations are designed primarily to relieve the individual from personal responsibility. For this reason, so-called professional corporations are in contravention of the purpose of professional registration.

4. In order to protect the public, it is necessary that State registration boards have first hand information concerning architects from other States who apply to them for registration. Many of the registration boards do not have the funds or other facilities for making a satisfactory investigation. Were they able to do this, it would mean that each State board would have to repeat the process of investigation every time an out-of-State architect applied for registration. Such duplication could not be carried on without unending delay in connection with each separate registration and undue annoyance to an architect's references and the educational institutions in which he received his training.

5. An architect who desires reciprocal registration credit will find it convenient and economical to apply through the National Council for such registration as, in most cases, he will be saved the necessity of personal appearance and an examination before any examining board other than that of his home State. While the Council does not guarantee to an architect that, in employing the services of the Council, he will be granted registration in any State to which he may apply, it does act as a clearing house by furnishing state registration boards with information concerning the qualifications, both educational and professional, of architects who apply for reciprocal registration. This the Council does by a thorough and disinterested investigation, the results of which are called a Council "record."

6. A Council Record is a certified transcript, in booklet form, of all replies to inquiries which have been addressed by the National Council to the applicant's references. It should be understood, however, that the mere possession of a Council record does not carry with it the endorsement or recommendation of the National Council of Architectural Registration Boards, nor does it give an architect any prestige. A Council record is simply unbiased authentic evidence concerning an architect's training, practice, and professional standing. With a Council record in hand, the registration authorities of the State in which the applicant desires reciprocal registration are supplied with evidence which is generally considered sufficient to determine whether or not an applicant is eligible for registration in accordance with the law of that State.

7. The time required to make the investigation and complete a Council record is usually from four to six weeks. For this reason, an architect who has any prospect whatsoever of securing business in States other than his State of original registration is at an advantage if he has had a Council record prepared in advance and ready for immediate use.

8. To employ the services of the Council for the purpose of securing a Council record, request should be made to the Secretary of the National Council of Architectural Registration Boards, 175 West Jackson Boulevard, Chicago, for the necessary blanks and instructions. This request should be under the applicants own letterhead and be accompanied by the following:

(*a*) A money order, check, or bank draft for Twenty Dollars ($20.00), plus exchange, if any, made payable to the "N.C.A.R. Boards," to defray the expense of preparing a Council record and transmitting the record to the registration board in the State in which application is being made for registration.

(*b*) A statement giving the State or States in which the applicant is at present registered, with the date and official number of each registration and, in each case, the manner in which such registration was obtained, whether by "exemption," "reciprocal registration credit," "written examination," or "oral examination." All architects should understand that registration "by exemption" does not constitute legal proof of competency and is therefore not a basis for registration credit.

(*c*) A statement as to the number of years that the applicant has been engaged in practice as a principal. A person may be considered a principal in the practice of architecture if, under the professional title "architect," he serves only one client, on a salary or other basis, in an office maintained by such client, if it can be established that he is entirely responsible for and in complete control of the architectural work and the management of that office, including the employment and discharge of all persons engaged on the design and supervision of the work.

(*d*) Except in States which do not have laws regulating the practice of architecture, it is illegal for an architect to practice as a principal unless he is registered. The mere fact that one participates in the profits of an architect's office is not practicing architecture as a principal.

(*e*) It should be noted: (1) that employment in an architect's office as foreman, draftsman, specification writer, or superintendent is not practice as a principal, or one of the principals, in charge of an architect's office; (2) that employment by a corporation is not practising architecture as a principal even though the title "architect" is used, where some officer of the corporation, or person other than the architect, has control of the employment and discharge of those engaged in the preparation of plans and specifications or supervision of construction; and (3) that business as a building-contractor, or employment as such contractor's superintendent, draftsman, or estimator, is not the practice of architecture.

General Instructions

9. The Secretary of the National Council will forward to the applicant an information blank upon receipt of the statements above requested and payment of the fee. Two forms of blank are used in making application for Council records; one for Senior applicants, or architects who have been engaged in practice as principal for ten or more years; and the other for Junior applicants, or those who have been in practice a shorter time.

10. The information blank is used as a negative for blueprinting and drafting ink must be used for filling in the blank. In case a typewriter is used, the form must be backed with a fresh black carbon. The applicant should retain a blueprint of his information blank in order to provide himself with a copy of the information filed with the National Council. By carefully checking over the blueprint, the applicant is able to determine whether every item, including signatures, is perfectly legible. Every part must be perfectly legible when blueprinted.

11. Emphasis is laid on the importance of using great care in filling out the information blank and making the statements as complete and comprehensive as possible, particularly in the following points:

(*a*) Actual dates of attendance at schools are important, and addresses of schools, secretaries of societies, clients, and architectural references should be accurately given.

(*b*) Architect references should be given regardless of applicant's classification as Junior or Senior.

(*c*) Please avoid, if possible, giving the names of relatives or partners as either architect or client references.

(*d*) "Architect" references (page 2) and "architect-employer" references (page 3) on the Junior information blank should not be duplicated.

(*e*) If possible, the members of examining boards should not be used as architect references, as such architects may be obliged to pass on the record.

(*f*) If the college or university from which the applicant graduated has a rule that a transcript of grades will not be furnished except at the request of the graduate, the applicant should enclose with his information blank a letter addressed to that institution authorizing it to furnish the Council direct with such a transcript. This authorization will be mailed to the registrar, or other proper officer, with the Council's request for a transcript of grades.

(*g*) Do not send letters of recommendations, photostats of diplomas or certificates, or transcripts of school records unless requested, as the Council uses only material which has been received in direct response to requests made by the Council.

12. An Identification Photograph is required and during the time that his record is being prepared, the applicant should arrange to purchase the film negative of an identification photograph, not less than 3″ x 5″, and preferably 5″ x 7″ in size, which he will furnish, with two (2) prints, to the Council office. Before making the prints, the negative shall be signatured by the applicant and his signature attested by two others, in drafting ink, so that all signatures will appear on the face of the prints. Attestations on the back of the prints are of no value as the prints are mounted in the Council record. Glass negatives are not acceptable.

13. A State fee is required and either at the time of sending the Information blank, or at some time during the preparation of his Council record, the applicant will be informed, by the National Council, as to the amount of the preliminary fee which he will be required to pay to the State in which he is applying for registration. Upon receipt of this information, the applicant will forward to the Council the amount of that fee (plus exchange, if any), made payable to the registration board of the State in which he is applying for registration. Only money orders, certified checks, or drafts are acceptable to State registration boards, and under no circumstances is a State fee to be made payable to the National Council. The remittance for the State fee will be held by the Council until the applicant's record is fully completed, when it will be forwarded with the Council record and (if one is required) the application form of the State.

The Council attempts to keep on file, in the Secretary's office, copies of the application forms and the laws of all States, so that it is in a position to prepare a State application for any applicant and forward it to him for his signature. From the State laws on file, it is possible to advise the applicant concern-

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AN ENGINEER'S REFLECTIONS

Highly Mechanized Civilization Cannot Function Adequately or Well Without the Aid of its Creator

By
FREDERICK H. DESHANT

MY ENGINEER friends, it is a genuine pleasure to be with you this evening, to discuss matters of mutual and vital interest to our profession. I wonder if we all realize the part that we have played in the creation of our modern social structure.

Permit me to draw from the Engineering Foundation a rather excellent statement of our professional activity and service.

"All around you are the works of engineers—highways, railroads, industrial plants, mines, machines, buildings. Each embodies scientific principles and accumulated experience made useful by engineers. Engineering, the work of professional engineers, is one of the arts which interpret and apply science and experience through material things and human abilities. Engineering has developed and now includes intelligent management. It translates the discoveries of scientists into useful structures, machines and processes. It applies experience by the methods of science. Its bedrock is science, its special tool is mathematics, and its aim is utility. Yet the functions and responsibilities of the engineer transcend the limits of professional practice, for the engineer does more than merely apply the discoveries of the scientist to physical creations.

Politics, which in its highest sense is "the administration of public affairs in the interest of peace, prosperity and safety of the state," is largely a task for the engineer. The vast activity of the political organism is increasingly concerned with problems which only engineers can solve. For direction the state calls to a profession which can impart to its affairs the maximum of certainty. Statecraft is therefore a field for the engineer.

The engineer is the ally of many groups which are shaping the destiny of the race. He is contributing to philosophy, ethics, economics and to the acquisition, preservation and spread of knowledge. Medicine, whose major objective is prevention of disease, must rely upon the systems of sanitation devised by the engineer, one of the chief custodians of public health. Banking and industry summon the engineer, for the things upon which they thrive are of his making. Credit, about which so much needs to be known, requires the knowledge of the engineer. At home and abroad, large investments are made in engineering projects; the engineer can help determine their soundness. The investor, whether wage-earner or capitalist, must turn to the engineer for his protection. The prospective engineer should reflect upon the influence which engineers thus exert in world affairs. A profession which modifies the material environment of all mankind, by use of the laws of nature, and in the modifying necessarily ignores artificial national boundaries, may with confidence accept as a trust the mission of promoting concord among all men and all nations.

These are illustrations of the universality of the engineer's calling and of the breadth of the engineer's obligation to society, and of society's debt to the engineer. Engineering is advancing human culture and raising the standards of public and private morality, while it lifts burdens, increases wealth, multiplies opportunity, and brings leisure for self improvement and enjoyment of life to growing numbers of persons.

There is, too, an esthetic side of engineering. Mining and civil engineering with their outdoor life provide opportunity for the enjoyment of nature's beauties, and engineering structures may be inherently beautiful in conforming to the laws of the forces and the natures of the materials controlling their designs. Architecture, landscape gardening and park development often are involved in engineering projects, so that structures may possess both beauty and utility. Pleasant cooperation with men in other professions thus occurs. Mechanical engineers are more and more giving attention to the beauty of the products of their machines. Electrical engineers continually deal with the senses of sight and hearing through which light and sound bring us great art. The chemical engineer contributes color, flavor and odor—all esthetic essentials.

To perform his duty the engineer must possess practical mindedness combined with imagination. He must continually look forward. He cannot stand still. Above all he must regard for truth. He must be suspicious of opinions and of theories unless they can be tested. He must be trained in the discrimination of relative values.

More is required of an engineer than knowledge of science and technology. He must be greater than the things he designs and uses. He should be a well balanced "man of full habit." Before he is an engineer, he is a human being, living in a community of other human beings, and of this fact he should never lose sight. To be properly successful he must cultivate the human touch and develop his ability to persuade and to lead men.

Ability to get along with people is especially important in an engineer because of the great diversity of his works and the consequent variety of men with whom he must deal—unskilled laborers, mechanics, contractors, merchants, lawyers, engineers of numerous specialties, architects, manufacturers, property owners, public officials, bankers, accountants, scientists, physicians, newspaper reporters, and this list is not complete. Many an engineering enterprise utilizes almost

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THE CONTRACT SYSTEM

versus

Day Labor Methods

In Construction Work

By
JAMES E. GIBBONS
(As presented to American Road Builders Association)

THE relative merits of the contract system versus the day labor method is a subject which is very well known to contractors, engineers, architects and all others who have been actively engaged in construction work. It is practically a totally unknown subject to the rest of our population with the exception of some few legislators. No matter which system is used, for the construction of both public and private construction projects, the general public pays the bill. Despite this, it never becomes a matter of general interest to the public at large and is of no political importance to elective officials.

Much has been said and written on this subject. The writer has collected same from many sources and he makes free and frequent use of same in this article. Perhaps, nothing new on the subject is added. However, what has been said and written on both sides has been entirely said or written by contractors, trade association representatives and Governmental department engineers and officials in discussions and hearings before legislative committees investigating either complaints or some proposed legislation. The evidence and the records of such hearings seldom, if ever, become public information and the general public remains ignorant of the subject.

In private work the day labor method is seldom used and when used it is usually only in occasional cases where it is the vehicle through which favoritism, special privileges, wild extravagances, and other abuses of the interests of the owner are effectuated. In public work construction, however, the use of the day labor method has been growing steadily for many years. It has received a great impetus through the present day relief work.

The effect and result of the two methods in public works construction is the subject with which this article attempts to deal.

By the "day labor system" on public work, is meant that method whereby governmental authority hires directly the supervisory forces and labor and provides the equipment and necessary materials. The same authority pays for all these items whatever their cost. Under this system all employees on the job are government employees. Plans and specifications and fairly accurate estimates of the final cost, are usually not available at the time of starting the project.

Under the "contract system" detailed plans are prepared, together with an engineer's or architect's estimate of cost. Competitive bids are taken and the award made to "the lowest responsible bidder." In many localities bidders are required to demonstrate their ability to satisfactorily perform the work contemplated before they are permitted to bid. The successful bidder is required to give bond that he will perform the work in accordance with the plans, on a definite cost basis and within a definite time.

When construction is carried on by day labor instead of by contract, the owner, either directly or through his representative, employs a superintendent of construction, engages mechanics, artisans, and laborers, and through him, purchases tools, machinery, and materials; and with his own forces, paid by daily wages, builds the structure. This is supposed to eliminate the contractor's profit or fee.

This would seem to be the ideal method as all chances of disputes with the contractor over contractual right, specification, changes in plans, and quantities, and quality of work are prevented. The owner, through his engineer, is at all times supreme. The reverse of this, however, is what generally happens.

Expensive machines and many tools are purchased, and later, when these are sold at the completion of the work, the loss sustained may more than equal the contractors' profit as the latter charges only a reasonable plant expense or depreciation. The machines and tools have a value to him for future jobs. Money is not always saved by renting costly machines instead of purchasing, as it is customary to make a per diem rental charge of such amount that one year's rental will equal the cost of the machine, and the renter also maintains the machine during the rental period.

Mechanics, laborers, and others, including the superintendent, not having any money interest in the job or even future employment at stake, are likely to do indifferent work. The job will drag. The cost will be greatly increased over the work done by the same men when employed by a contractor. The contractor's living and profits must be made by saving materials and obtaining more efficient work from his employees. His money is at stake as well as the owner's; therefore, the greater the saving effected by the contractor, the larger his profit.

In purchasing materials and making subcontracts, the contractor saves money over an owner, as he knows where and when to buy and how to handle and keep subcontractors busy. This is an incentive to them to bid low prices. The savings accrue not to the contractor but to the owner, as the contractor obtains these low prices and figures before bidding and bases his proposals upon such estimates.

Thus, construction performed by a contract proves to be cheaper (save in exceptional cases) than when done by the day labor method.

The contract system means quickly finished jobs as it is to the contractors' interest to expedite the comple-

tion of the job. Specifications are rigidly followed resulting in first class work and savings for the owner.

The day labor method leads to extravagance, prolongation of the work, in order to hold positions, poor workmanship, negligence, and frequently, downright dishonesty resulting in an indifferent quality of construction.

With day labor forces, the specifications are frequently ignored, poor work is covered up and skimmed over to prevent the owner from finding fault, or advantage is taken of his ignorance regarding construction.

The reasons usually advanced in justification of day labor are:

1. That an emergency exists which will not permit preparation of plans.
2. That maintenance work precludes advanced estimates of the scope of the work.
3. That it is necessary to conduct experimental projects by day labor to secure a check on bid prices of contractors.
4. It is necessary for the Government to do work by the day labor method in order to keep contractors' prices down.
5. It is necessary because contractors are sometimes without sufficient equipment to handle some particular project.
6. The Government should do work by the day labor method because it can do its work more efficiently than private contractors.
7. It prevents collusion between contractors.

These are the theories usually advanced in favor of the day labor method, but they are seldom, if ever, borne out in practice.

The general effect and result of the use of the day labor system may be summed up as follows.

1. It trespasses on private enterprise.
2. It usurps the functions of properly constituted organizations which have been perfected, by long years of experience, in the science of economically performing construction work.
3. It performs construction work without regard to its cost, quality or time of completion.
4. It is not bound by the hard and fast provisions of contract and specifications, therefore, the nature of the work can be changed at the whim of some public official, and the cost and time of completion extended indefinitely.
5. It does not permit an accurate determination of the cost of its projects. The party who pays the bill is kept in ignorance of the true cost.
6. The work is never performed within the low limit of the cost resulting from the competition of private enterprise on similar work.
7. It destroys initiative and ingenuity which are inspired only under the lash of keen competition.
8. It loses the benefit of the long experience of individuals trained under the pressure of keen competition.
9. It produces an inferior quality of work because the inspection is done by the same forces that do the construction.
10. It obviously reduces the Government's income which is largely obtained from the earnings of private business enterprise.
11. It leaves a wide open door for additional appropriations and the inevitable resultant trading of favors, log rolling, pork barrels, etc.
12. It increases, above those necessary, that vast horde of *unnecessary* Government employees which have already all but wrecked the credit of most municipalities.
13. Its incomplete records of costs do not permit the accurate estimating of future projects even though similar in character.
14. It results in the accumulation of a vast amount of unnecessary and inadaptable equipment which is maintained and ultimately disposed of at great loss.

(When done by the Federal Government, it creates an example which is bound to be followed to their disadvantages by states, municipalities, and subdivisions of same.)

15. It is un-American, uneconomical, socialistic, confiscatory, and destructive.
16. It is perversive of the very fundamentals of our type of government.
17. It sets up an unfair competition with private industry which results in no advantage to the government or the country at large.
18. It substitutes for free play of competition and individual ability the insidious forces of political ambition and power.

There are innumerable examples which could be quoted in support of all of the above objections, but space does not permit of more than a few.

In the Congressional Record of 1926, is found reference to a case which is more or less typical and illustrative of the difference between the contract system and the day labor method.

"A contractor constructed a large piece of road work under the supervision of a chief engineer who was an exceptionally capable and energetic engineer. The contractor finished the job he had, under bond, on time, and to the complete satisfaction of the department of jurisdiction and at some profit to the contractor.

"The contractor's bid was 20% lower than the engineer's preliminary estimate. The engineer had access to the contractor's cost data, he was familiar with the methods and equipment used and personally knew the men working for the contractor. He therefore was convinced that by doing similar work in the future with his own forces and under his own direction, he could save for the Government any profits which a contractor could make.

"So the next project which came up in his district he undertook to do by day labor. It was practically identical with the contract just referred to, ran through the same character of country and the quantities and materials were almost identical. He secured the same superintendent and many of the foremen and keymen used on the former job.

"At the completion of the contract the engineer stated that despite his best endeavors, his costs overran his own preliminary estimate and he was convinced that there was no merit in the day labor method.

"The superintendent who had been efficient when working under the contract system had proven inefficient under the day labor system. He was replaced by others, all of whom also proved to be inefficient.

"This engineer stated further that it was his opinion that the men were affected by the fact that they were working for the Government. They knew the engineer, personally, did not stand to gain or lose any actual money on the job and accordingly they did not feel the

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ITEMS OF GENERAL INTEREST

REPORTS, NEWS, COMMENTS

STATE ACTIVITIES

Correspondents and readers are invited to submit for publication items of interest to the professional engineer of the country. Such material should be forwarded as quickly as possible in order to keep news up to date.

EUROPE CORRESPONDS

Requests Report on Professional Recognition

From Ingenuier Walter Dardel of Aarberg-Berne, Switzerland, comes a communication asking for data on the "Engineering Profession and the Professional Recognition of the Engineer in the U. S. A."

The information requested is in response to a decision of the Swiss Society of Engineers and Architects. The National Society, through President Steinman, has forwarded a summary of conditions, aims and accomplishments.

The professional movement continues. It marches from county to state, state to nation and nation to foreign lands.

BERLIN CONGRESS

Structural Engineering Conclave October 1st — October 8th

The Secretariat for the International Association for Bridge and Structural Engineering forwards the following:

INTERNATIONAL ASSOCIATION FOR BRIDGE AND STRUCTURAL ENGINEERING

Congress in Berlin, from 1st to 8th of October, 1936

The International Association for Bridge and Structural Engineering will hold its 2nd International Congress from 1st to 8th October 1936 in Berlin, attendant upon an invitation from the German Government. The German Government has accepted the patronage of the Congress and has already officially invited the various States to designate a delegation for the Congress. The invitations will be sent out in March and will contain a preliminary list of the reports and contributions to the discussion. The following themes will be dealt with:

1) Importance of the toughness of steel for calculating and dimensioning steel structural work, especially when statically indeterminate.

2) Stressing and degree of safety in reinforced concrete structures, from the designer's point of view. (a) Influence of continuous and of repeated loading. (b) Means for increasing the tensile strength of concrete and for reducing the liability of cracking. (c) Adoption of high-tensile steel. (d) Influence of joints of concreting and of dilatation.

3) Practical questions in connection with welded steel structures. (a) Influence of dynamic and frequently alternating loading on welded structures. (Research work and its effect or practice). (b) Design and execution of welds with special consideration of thermal stresses. (c) Inspection and control of welded joints. (d) Experience with completed structures.

4) Recent points of view concerning the calculation and design of bridge and

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RENDERING SERVICE

Public Education Activity

The following, which appeared in the February issue of Water Works and Sewerage, is an outstanding example of real service to the profession:

ON OPERATOR LICENSING

(A Letter to the Editor)

Dear Sir:

In the article entitled, "Short Schools and Licensing," in your December issue, Mr. Edward S. Hopkins discusses a subject which should be the immediate concern of the engineering profession. The fact that state licensing has long been recognized in the medical and legal professions and that it is rapidly gaining ground in the engineering profession has apparently been disregarded.

Professional engineers only are qualified to control the operating requirements of the works they design. If we have to depend on the understanding of political office holders on engineering matters, there will be no protection of the public, which is the primary object of licensing. It does not need much experience to show that education of municipal office holders as suggested by Mr. Hopkins would be impractical. Legal procedure is the only means of obtaining control. Under the process of law, a person can be prosecuted, but if there is no law, there will be confusion. Without laws, even conscientious minorities would be powerless against a political machine.

With a license law in force there is only one road to follow, whereas, an attempt to educate each incoming administration would be futile.

Operator licensing should be a function of the various state boards of engineering examiners who also license professional engineers.

Municipal licensing of operators should be abolished. It is a handicap as well as an inconvenience to qualify operators. State licensing of operators would qualify a man to operate a plant anywhere in the state and would also have the advantage of being a uniform requirement throughout the state.

A person licensed as a professional engineer should need no further license for engineering work of any kind. Engineers should get together for the adoption in every state of professional engineers' license laws patterned as closely as possible to the Model Law. They should also bend their efforts toward the adoption in every state of uniform license laws for operators in steam plants, electric plants, chemical plants, etc. The various schools could then very easily adapt their curricula to the legal requirements. State licensing should be considered the lower crust through which a man should break in order to qualify. The

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DISTRICT OF COLUMBIA

Society Meets

From the pen of Virgil C. Wagner, Chairman of the Publicity Committee, comes the following:

"The District of Columbia Society of Professional Engineers, at its meeting on January 14, 1936, elected the following officers for the year:

President, John W. Dunham; Vice-President, Frank C. Biberstein; Treasurer, Major Albert Sutter; Secretary, Miles Elias Myers; Directors, Joseph Barnett, Gregor Heine, Maurice D. Kiezales, R. C. Miller, Virgil C. Wagner; Supervisory Committee, Gregor Heine, Frazer Hilder, M. C. Steuber.

"Prior to the election of officers Engineer Dunham, Acting President of the three-months-old Society, read a report of what had been accomplished, and outlined the points he thought should be concentrated on during the coming year. His report was complete, concise, and received the whole-hearted approval of the members.

"The next meeting of the District of Columbia Society of Professional Engineers was held on March 11, 1936 at the Raleigh Hotel. The Officers, Board of Directors, some members and guests had the pleasure of having dinner with the guest speaker, the Honorable Hugh L. Kerwin, Director of Conciliation of the United States Department of Labor.

"Mr. Kerwin gave an excellent talk at the meeting, regarding the method of solution of the many problems which the Labor Conciliators have to aid in solving. In particular he pointed out the part Engineers play in the designing of new machines and methods pertaining to building construction and how closely these changes affect the state of mind, peace and security of the contractor, mechanic and laborer.

"Upon completion of Mr. Kerwin's talk, the Society's business was taken up, and reports of the various committee chairmen heard. The most interesting and important of these was that of Engineer Barnett, Chairman of the Legislation Committee, who stated that his committee had succeeded in interesting Congressman James L. Quinn, of Pennsylvania, in a proposed bill for the registration of Engineers in the District of Columbia, which, but for minor changes, is a copy of the Model Law. He also reported that the Washington, D. C. Chapter of the American Society of Heating and Ventilating Engineers would act jointly with the District of Columbia Society of Professional Engineers in fighting for the passage of this bill.

"The surprise and treat of the evening was an unexpected visit by our National Secretary, Engineer W. S. Conlon, who gave an interesting report of the Nation

(*Continued on page* 16)

NEW YORK

Proposed Legislation

Bills introduced by Senator Berg:

Engineer John C. Riedel, President of the State Society, has sent the following telegram to both the Codes and Judiciary Committees of the Senate and the Assembly:

The New York State Society of Professional Engineers wishes to record its vigorous opposition to the passage of the Berg bills, Senate Introductory No. 123 and No. 1092 relating to the practice of law. The bills seek to curtail and limit the long established functions of engineers and architects in acting for clients before bodies upon matters relating to the practice of the professions of engineering and of architecture.

Engineer Arnold G. Chapman, Past President of the State Society will represent the Society at the hearings held by the respective committees.

Certified Real Estate Appraisers Bill introduced by Senator Joseph:

The provisions of this bill tend to restrict the activities of engineers and architects in the appraisal field. As the evaluation of public or private property and works comes within the scope of engineering and architectural practice as defined by law, the Society is making a determined effort to safeguard the right of engineers and architects to render service in this field of activity.

Building Application Forms

On printed application forms for the approval of plans now in use in the Departments of Buildings in the City of New York a blank space is left for the signature of an "Architect." A request that the designation "Professional Engineer" be added to that of "Architect" on new printed forms has been forwarded to the Board of Buildings at the solicitation of Engineer John C. Riedel, President of the State Society.

Inappropriate Engineering Designations

Attention has recently been directed to the Civil Service title of "Custodian Engineer," which designation is not in harmony with the spirit of Art. 55 of the State Education Law. Endeavors are being made by the State Society to amicably secure the substitution of a designation more accurately descriptive of the services performed in accord with the intent of the licensing law.

W.P.A. Activities

Delegations of professional engineers headed by Engineer D. B. Steinman, President of the National Society of Professional Engineers, and Engineer John C. Riedel, President of the State Society, have conferred with Mr. Victor F. Ridder, Works Progress Administrator for the City of New York and advocated economic and organization changes which would promote the efficiency of the W. P. A. organization, advance the well-being of professional engineers, and redound to the benefit of all engaged in engineering activities. The courtesy extended by Mr. Ridder to the delegations, and the interest manifested by him in their representations, give assurance that their recommendations will receive his understanding and sympathetic consideration.

Engineers Licensing Examinations

A total of 500 candidates took the January 1936 written examinations under

(*Continued on page* 16)

KENTUCKY

Prepares Anew for Registration

The failure of the legislature to pass a registration act has served to arouse engineers of Kentucky to a new determination for the enactment of legislation regulating the practice of professional engineering.

Plans for a campaign of education are being laid by the Kentucky Society under the leadership of President B. M. Brigman of Louisville, and Secretary C. S. Crouse of Lexington. The National Society will aid in the endeavor to bring Kentucky within the fold of Registration States.

PENNSYLVANIA

Chapters Active

PITTSBURGH

President Steinman of the National Society addressed an enthusiastic gathering at the recent meeting of the Pittsburgh Chapter. Thirteen new members resulted from the address of Engineer Steinman.

Prior to the meeting the Board of Directors and the Committee Chairmen held a dinner meeting at which policies and activities were discussed and developed.

PITTSBURGH CHAPTER

Engr. R. Canfield, Chairman of the Publication Committee forwards the following:

The February meeting of the Pittsburgh Chapter Pennsylvania Society of Professional Engineers was celebrated on Friday evening, February 28, 1936 in the Rose Room of the Fort Pitt Hotel.

It was a celebration too. We had with us National President Engineer D. B. Steinman. The meeting was called to order at 8:00 o'clock with Engineer Samuel Eckels in the chair. Engineer Eckels introduced the speaker of the evening Engineer Steinman who then addressed the assembled engineers.

The keynote of the address was "The Engineer United and Militant." Engineer Steinman not only went into this phase of the Society, but enlarged fully on the aims and objectives of the Society. This was particularly welcome to the Pittsburgh Chapter at this time. After the close of the address Engineer Steinman very pleasantly held a question and answer period. This was actively participated in by everybody, and it is believed that every engineer present went home with a better understanding of the aims of the Society and a better will for united action.

Engineer Eckels suggested that engineers present desiring to join the Chapter might do so by giving their names to Engineer Secretary Aires. A motion of thanks to Engineer Steinman for his address was unanimously passed when the meeting was adjourned.

Adjournment was a signal for everyone to congratulate Engineer Steinman. Many engineers found friends and acquaintances not seen often except in a business way. Soon from the room rose a buzz of conversation from the unsocial engineer—maybe.

The Committee on Meetings arranged for 125 chairs to be placed in the Rose Room. The ushers Engineers Atwater and Canfield were looking for seats before the evening was over.

The following engineers became members of the Chapter:

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CONNECTICUT

Selects National Director

Engineer Joseph W. Cone, of Greenwich, a member of the State Engineers' Examining Board, has been elected National Director for the Connecticut Society of Professional Engineers.

In the persons of Engrs. H. E. Harris, of Bridgeport, President; J. R. MacIntyre, of South Norwalk, Secretary, and Joseph Cone, of Greenwich, National Director, the Connecticut Society is ably officered. Members of the profession are urged to communicate with the officers listed on page four of the American Engineer.

President Harris is pressing an active campaign to make the law effective and to secure real professional recognition for the engineer.

WEST VIRGINIA

Re-Affirms Affiliation

The Executive Committee of the National Society has approved the application of the West Virginia Society of Professional Engineers for definite membership in the association of States of which the national body is composed. A year of affiliation has improved the respect of each for the other.

The newly elected President of the State Society is Engr. J. E. Settle of Charleston and the re-elected Secretary is Robert Williamson, Jr. Professional engineers are urged to communicate with the officers whose names and addresses appear on page four of the American Engineer.

The following resolution, indicative of the initiative of the State Society, was adopted at its second annual meeting recently held in Huntington:

Whereas it has been reported to this meeting that efforts will be made to place the Professional Engineers in the District of Columbia under a model registration law, therefore, be it resolved that the executive secretary be instructed to request all local chapters to contact their representatives in the United States Congress in the interests of the enactment of a proper registration law for Professional Engineers in the said District of Columbia.

VIRGINIA

Proposes Amended Law

Engineering groups in Virginia have agreed to further the passage of legislation amending the present law in such manner as to put teeth in the same.

Appended herewith is the proposal now before the legislature:

A BILL

To amend and reenact Sections 1, 5, 6, 7, 8, 13, 17 *of an act entitled "An act to provide for the examination and certification of professional engineers, architects and land surveyors; and to regulate the practice of engineering, architecture, and land surveying; to establish their relation to public works and the surveying and platting of land," approved March* 19, 1920, *as heretofore amended.*

1. Be it enacted by the General Assembly of Virginia, That sections one, five, six, seven, eight, thirteen and seventeen of an act entitled "An act to provide for the examination and certification of professional engineers, architects and land surveyors; and to regulate the practice of engineering, architecture, and land

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DISTRICT OF COLUMBIA

(*Continued from page* 14)

al Society's activities since the first of the year."

May we request that in addition to the above you also print the following: "All Professional Engineers interested in aiding this Society in obtaining a registration law in the District of Columbia are requested to write personally, or have their Society Secretary write to their Congressmen requesting their support of this proposed legislation."

NEW YORK

(*Continued from page* 15)

the Engineers' Registration Law in New York State. Of these, 89 were conditioned, 25 failed, and 386 passed.

At the February meeting of the Board of Examiners, 169 applications were considered. Of these, 12 were held for interview, 53 were scheduled for written examination, 47 were rejected, and 57 were approved for license.

State Society Mid-Winter Meeting

A large and enthusiastic gathering of engineers from all parts of the state attended the mid-winter meeting at the Ten Eyck Hotel, Albany, on March 7th, 1936.

The resolutions committee under the Chairmanship of Engineer Arthur V. Sheridan, Past President of the Society, submitted the following resolutions which were adopted:

A proffer to the State Board of Examiners, by the State Society, of the services of its State and Chapter organizations and Committees, to such extent as the Board desires, in the investigation of the experience and character qualifications of applicants for licenses.

That it is the opinion of the meeting that the following provisions should be incorporated in the Constitution of the State Society:

(1) Attendance at meetings of the State Society be unrestricted but voting at such meetings shall be limited to delegates from the various chapters:

(2) Each Chapter shall be entitled to send two delegates to each meeting, plus one additional delegate for each 25 members in the Chapter in excess of a minimum (to be established by the State Society).

That the various Chapters petition the Boards of Trustees, Commissioners and other public officials of cities and villages having a population in excess of 8,000 inhabitants, to consider for appointment to the position of Superintendent of Public Works only licensed Professional Engineers.

That the Society, (a) directs the attention of the Board of Examiners to the necessity for a thorough examination, on and after January 1st, 1937, of all applicants for a license to practice Professional Engineering, in the fields of mathematics, physics, chemistry and in the applied sciences developed thereon and used in the several branches of engineering, together with, and in addition to, an examination in such professional, social, economic and other subjects as may be found from the practice of engineering to be essential to the protection of life, health and property and (b) record its opinion to the effect that public interest and the intent of the law require that the examination shall be at least equal to that exacted of candidates for the practice of law and medicine and shall require not less than two nor more than four days.

The State Society recommends to the Works Progress Administration the following proposals:

1. Reclassify all employees, except those actually performing engineering work, bearing the title of Engineer, with or without qualifying adjective, under such appropriate classifications as Superintendent, Foreman and other titles common to the execution of construction work.

2. Require the public agency sponsoring the project to furnish, either through its own personnel or with the aid of persons loaned or supplied by the Works Progress Administration, all plans, specifications, lines, grades, inspection and other engineering elements incidental to the execution of the work.

3. Reduce the number of engineering titles to a minimum and avoid such as are in conflict with those of the public agencies which sponsor the projects.

The Society (a) records its opposition to the practice of establishing maximum fees for architectural and engineering services on Federal Aid projects that discourage competent engineers, or invite unfair competition, and (b) urges upon the Public Works Administration a reconsideration of its fees as promulgated in its bulletin issued on February 26th, 1936.

NIAGARA COUNTY

A dinner-meeting of the Niagara County Chapter was held at Hannel's, Niagara Falls, on March 5th, 1936.

Mr. James O. Hoyle, Investigator, State Department of Education, and Mr. R. A. Kirkpatrick of the Union Pacific Railroad, were the guests of the Chapter. The latter delivered an absorbingly interesting lecture on Boulder Dam.

WESTCHESTER COUNTY

At the Chapter meeting held on March 4th, 1936, at the County Center, White Plains, Major L. Alfred Jenney, Consulting Engineer and Member of the American Society of Civil Engineers, discussed a highly comprehensive scheme for connecting metropolitan focal points in New Jersey, Westchester and Long Island by subway with Manhattan—the heart of the City of New York.

All members of the Chapter are being encouraged to volunteer, and be scheduled, to deliver short talks on non-technical subjects.

The Committee on Good Government is opening the way to highly valuable service by the Chapter.

BRONX COUNTY

Over a hundred members and guests of the Chapter made a merry gathering at a dinner-dance held at the Schnorer Club on February 19th, 1936.

At the annual meeting held at the Concourse Plaza Hotel, on March 5th, 1936, the following officers were elected: President, Raymond J. Van Wagner; Vice-President, Rudolph C. Lang; Secretary, H. McKean Connor; Treasurer, Solon E. Friedeberg; Directors for three years, Rudolph Cook, W. L. A. Arctander, Raymond C. Sullivan, Patrick H. Murray.

PENNSYLANIA

(*Continued from page* 15)

John Farris, Charles Stratton Davis, E. H. Stumpf, David Camilli, William F. Schwerin, W. E. Brown, F. Merian, Paul Purchard, A. D. Keagy, Byron L. Keim, G. S. Richardson, Edward J. Ducey and F. G. Ross.

With the words of Engineer Steinman, may the Pittsburgh Chapter offer a toast to the National Society, the State Society and particularly the Brother Chapters in Pennsylvania together with their members, "The Engineer United and Militant."

LEHIGH VALLEY

The Membership Committee, under the direction of J. A. Gish, Jr. is undertaking an intensive campaign. At a February meeting of the Chapter seven new members were admitted.

The National Society acknowledges the comments and efforts of the Chairman.

LAFAYETTE COLLEGE

Engineering School Holds 70th Anniversary

The School of Engineering at Lafayette has entered upon its 71st year. The occasion and the celebration merit recording.

The following history of the School is of interest to engineers:

"Lafayette College is justly proud of its position as a pioneer in technical education. Engineering was offered for the first time during the 1865-66 college term, when the Pardee Scientific Department was established following the receipt of a $100,000 endowment, the gift of Ario Pardee, of Hazleton, Pa. The Pardee Scientific Course, which led to the degree of Bachelor of Science, provided options in engineering, chemistry and mining, the term "engineering" at that time implying the preparation for the profession of Civil Engineering.

In the spring of 1871 this system was altered and the degrees of Civil Engineer and Mining Engineer were awarded at commencement, William S. Kent and John E. Watkins receiving the degree of Civil Engineer, and Alexander Bryden, Morris Hunter Cone and William McMurtrie, the degree of Mining Engineer.

It is interesting to note that, while no formal courses leading to engineering degrees were established until 1866, the founders of Lafayette in their charter, originally framed in 1824 and granted in 1826, specifically mentioned that courses in "Civil and Military Engineering" should be taught in the proposed college.

The first two engineering professors were Dr. Henry S. Osbor, who occupied the chair of Mining and Metallurgy in 1866, and Professor Henry F. Walling, who occupied the chair of Civil Engineering in 1867.

Electrical Engineering was introduced into the curriculum in 1889 when Professor James W. Moore, of the Physics Department, and Professor Justus Silliman, of the Mining Engineering Department, agreed to offer a course in this subject without cost to the College.

The Mechanical Engineering Department, established in 1910, was made pos-

sible by a gift of $100,000 from Andrew Carnegie. Professor Edwin O. Fitch was the first head of the department.

Chemical Engineering was established in 1915 with the late Dr. Edward I. Hart as its head.

From 1871 to 1915 the technical degrees of C. E., E. M., etc., were given to students completing the four-year courses. Since 1915 the undergraduate degrees of Bachelor of Science in the various branches of engineering have been given.

Today in each of the engineering courses there are both technical B.S. and administrative B.S. degrees, the student being given the option of working for either one.

The engineering departments are housed today in several of Lafayette's largest buildings.

VIRGINIA

(*Continued from page* 15)

surveying; to establish their relation to public works and the surveying and platting of land," approved March nineteenth, nineteen hundred and twenty, as heretofore amended, be amended and reenacted so as to read as follows:

Section 1. Within thirty days after this Act becomes effective, the Governor shall appoint a State Board for the examination and certification of architects, professional engineers, and land surveyors, to be composed of three architects, three professional engineers, and three land surveyors; who shall have been in the active practice of their profession as principals or as instructors therein for not less than ten years previous to their appointment. *Two of the land surveyor members shall be qualified as professional engineers and designated to serve also as engineer members, thus providing five members for the engineering section of the board.* Three of the members of said Board shall be appointed to hold office for a period of one year; one for a period of two years; one for a period of three years; one for a period of four years; one for a period of five years; one for a period of six years; and one for a period of seven years; and thereafter upon the expiration of the terms of office of the persons so appointed, the Governor shall appoint their successors for terms of seven years, and said persons so appointed shall have the above specified qualifications. In case a successor is not appointed at the expiration of the term of any member, such member shall hold office until his successor has been duly appointed and has qualified. Any vacancy occurring in the membership of said Board shall be filled by the Governor for the unexpired term.

Section 5. In order to defray the compensations and expenses above provided, and any other expenses incident to the proper discharge of the duties of the Board, each applicant for a certificate to practice as a professional engineer, architect or land surveyor, as the case may be, in this State, shall pay the Secretary of the Board a fee of twenty-five dollars for each examination in any branch as defined in this act. Five dollars of this fee shall be returned if certificate be not granted. Certificates of registration shall expire on the last day of the month of December following their issuance or renewal, and shall become invalid on that date unless renewed. It shall be the duty of the Secretary of the Board to notify by mail every person certified hereunder of the date of the expiration of his certificate, and the amount of the fee required for its renewal for one year; such notices shall be mailed at least one month in advance of the date of the expiration of said certificate. Renewal may be effected at any time during the month of January by the payment to the Secretary of the board of a fee of five dollars for professional engineers and architects, or two dollars and fifty cents by land surveyors. *Upon* the failure of any *such* registrant to renew his certificate annually in the month of January, as *required above, his certificate to practice shall be revoked but such certificate shall be renewed at any time prior to December thirty-first of such year upon the payment of a fee of ten dollars by professional engineers and architects and five dollars for land surveyors. Should the certificate not be renewed as provided above, the applicant may be required to present reasons why such certificate should be renewed. The Board may then in its discretion grant a renewal of such certificate or may require re-examination. The application fee shall be* $15.00 *under these circumstances.*

Section 6. In order to safeguard life, health and property, any person practicing or offering to practice as an architect, a professional engineer, or a land surveyor in this State shall hereafter be required to submit reasonable evidence to the board that he or she is qualified so to practice, and to be certified as herein provided; and from and after January first, nineteen hundred and twenty-five, it shall be unlawful for any person to practice or offer to practice in this State as an architect, a professional engineer, or a land surveyor, except under the provisions of this Act.

Officers of the State, or of cities, towns and counties in the State having supervision, control and inspection of architectural and engineering construction, or the issuance of permits therefor, shall require that all plans submitted to them by any one bear the signature of a legally certified architect, or professional engineer, whenever it appears that public safety is involved.

Section 7. Any citizen of the United States or any person who has declared his intention of becoming such citizen, being at least twenty-one years of age, of good character, *and who has had training and experience in architecture, professional engineering or land surveying work which in the opinion of the board qualified him to practice,* may upon the payment of the fee prescribed in this act, apply for a certificate under this act, but before receiving such certificate, he shall satisfactorily pass an examination in such professional subjects as may be prescribed by the board and satisfy it as to his practical experience, general standing and ability.

In determining the qualifications of applicants for certification as architects, a majority vote of the architect members of the board only shall be required; in determining the qualifications of applicants for certification as professional engineers, a majority vote of the engineer members of the board only shall be required; and in determining the qualifications of applicants for certification as land surveyors, a majority vote of the land surveyor members of the board only shall be required.

Section 8. The following shall be exempted from the provisions of this act:

(a) *The practice of professional engineering and land surveying by a certified architect when such practice is incidental to what may be properly considered an architectural undertaking; the practice of architecture and land surveying by a certified professional engineer when such practice is incidental to an engineering project.*

(b) Practice as a professional engineer, architect, or land surveyor in this State by a person not a resident of this State and having no established place of business in this State, when his practice in responsible charge of work does not aggregate more than fifteen days in any calendar year; provided, that said person is legally qualified for such professional service in his own State or Country.

(c) Practice as a professional engineer, architect, or land surveyor in this State by any person not a resident of and having no established place of business in this State, or any person resident in this State, but whose arrival is recent; provided, however, that such person shall have filed an application for certification as a professional engineer, architect or land surveyor, and shall have paid the *fee provided for in sections five or seven* of this Act. Such exemption shall continue for only such reasonable time as the board requires in which to consider and grant or deny the said application for certification.

(d) Engaging in professional engineering, architecture, or land surveying as an employee under a certified professional engineer, a certified architect, or a certified land surveyor; provided, that said practice may not include responsible charge of design and supervision.

(e) Practice of professional engineering, architecture or land surveying solely as an officer or as an employee of the United States.

(f) *Practice of architecture, professional engineering and land surveying by an individual, on property owned or leased by said individual, unless the same involves the public health or safety.*

Section 13. *No State license to practice architecture, professional engineering or land surveying shall be issued by the Commissioner of Revenue to any one, except upon satisfactory evidence that such person is certified in accordance with this act and holds a current renewal card.*

Nothing in this act shall be construed to exempt any professional engineer, architect or land surveyor from the payment of any license tax imposed by existing law.

Section 17. *All violations of this act, when reported to the State Board for the Examination and Certification of Architects, Professional Engineers and Land Surveyors, and duly substantiated by affidavits, or other satisfactory evidence, shall be investigated by it, and if the report is found to be true and the evidence substantiated, the board shall employ legal counsel to be paid by the Treasurer of the State from fees collected by the board; and said counsel shall report such violation by order duly entered for prosecution to Attorneys of the Commonwealth, City or County in which the offense occurs.*

OHIO

Society Annual Convention

The annual convention of the Ohio Society was held at Columbus, February 11th-13th, with an attendance of approximately 900.

Amongst the matters upon which action was taken are: the adoption of a new constitution; a schedule of fees and salaries; unfair competition between practicing engineers and faculty members of engineering schools.

Perry T. Ford, Treasurer of the National Society of Professional Engineers, was elected President, and John Laylin re-elected as Secretary.

REPORT OF COMMITTEE FOR STANDARDIZATION OF ENGINEERING PRACTICES

Division A

Minimum Fees for Engineering Services

1. Scheduled fees shall cover engineering services including preliminary estimates and preliminary reports; complete detail plans and specifications, and detailed estimates of cost; general supervision of construction; preparation of monthly and final estimates for contractors payments; but do not include property, boundary or right-of-way surveys; inspection of construction; shop, mill, field or laboratory inspection of materials; cost of test borings and other subsurface explorations, or calculations of special assessments, which service shall be furnished by the Client or at the Client's choice, may be provided by the Engineer at actual cost. The Engineer shall furnish resident supervision of the work including line and grade surveys, if required, at actual cost of field payroll and field expense.

N. B. The fees do not include the time or service of the Engineer to prepare for or to appear in litigation in behalf of the Client.

2. Basic Minimum Engineering Fees shall be used for bridges, buildings, power plants and electrical transmission, distribution and street lighting systems, sewerage and sewage treatment improvements, water works and water treatment improvements, waste disposal plants, dams and locks, and other similar improvements.

3. Paving, sidewalks, heavy grading and extensions of water lines for local service shall be subject to a reduction of one percent from Basic Engineering Fees. These reduced basic engineering fees to include resident supervision, but not inspection for the various classes of work specified in this paragraph.

4.

Cost of Construction		Basic Minimum Fee (%)**** plus or per diem
less than—$	10,000	10.0
$ 10,000—	25,000	8.5
25,000—	50,000	7.5
50,000—	100,000	7.0
100,000—	250,000	6.5
250,000—	500,000	6.0
500,000—	750,000	5.5
750,000—	1,000,000	5.25
over	$1,000,000	5.0

5. The distribution or "breakdown" of above schedule within total percentage of costs or for lump sum shall be as follows: (all in percentages of the scheduled fee.

(*) Preliminary estimates and Preliminary reports, 10%; (**) Detailed plans and specifications, 55%; (***) General supervision, 35%; (****) Basic minimum fees, 100%.

6. The above schedule is understood to be minimum fees for normal conditions and may be increased for difficult or unusual conditions.

7. Should the Engineer be required to render additional service because of changes, delays or other causes beyond his control, then the Engineer shall be compensated for such additional services on the basis of the per diem rate set forth herein.

8. Where non-Federal work is financed in whole or in part by the Federal Government, the schedule of fees herein above shall be increased by one per cent of the cost of construction.

9. Basic scheduled fees may be reduced twenty-five percent (25%) for services to Architects or other Engineers by mutual agreement or where reciprocal privileges are accorded.

10. The basic fee includes the furnishing of three (3) copies of reports, plans and specifications (on paper). Additional copies shall be furnished to the Client at cost. Original documents, survey notes and tracings shall remain the property of the Engineer.

11. The minimum fee for "Preliminary Estimates and Preliminary Reports" as set forth in the preceding breakdown of the basic fee is not intended to cover engineering services in connection with preliminary investigations and reports involving detailed consideration of operations, maintenance and overhead expenses, the preparation of rate schedules for the sale of utility service, and consideration of the economic feasibility of such projects as municipally or privately owned electric or other public utilities of a competitive nature. Fees for engineering services in connection with preliminary investigations and reports of this nature shall be on the per diem rate set forth herein or a lump sum basis. The lump sum fee shall be not less than fifteen percent (15%) of the basic minimum engineering fee (expressed as a percentage in paragraph four applied to the Engineers preliminary estimate of the probable cost of the project. Should the Engineer be engaged subsequently to furnish detailed plans and specifications and the general supervision of construction, a part of the per diem or lump sum fee for the preliminary investigation and report equivalent to ten percent (10%) of the basic engineering fee shall apply as a credit on the basic fee.

Minimum Per Diem Fees

12. (a) Fees may be based on a per diem rate where the nature of the service to be rendered by the Engineer is such that a percentage fee is not adaptable or convenient, such as consultion and preliminary investigations. The fee for the principal shall be at the rate of $40.00 per day, with rates above this minimum commensurate with the nature of the service and the experience and the professional standing of the Engineer.

(b) Fees for services in connection with legal proceedings shall be at the minimum rate of $50.00 per day except that the minimum fee for appearance in court shall be $50.00 per day or fraction thereof. The Engineer shall be reimbursed for "outside expense" at net cost.

(c) All services of assistants, draughtsmen and etc., to be paid for at actual cost plus one hundred percent (100%) for overhead, "readiness to serve," and profit or at an equivalent minimum per diem rate, and in either case plus "outside expense" at net cost.

(d) The term "outside expense" shall include transportation and subsistence expense incurred by the engineer or his assistants while traveling in discharge of duties connected with the work, and shall also include the net cost of incidental expenses such as telegrams, telephone toll charges, extra reproductions of prints or photos of drawings, specifications and other documents required for the proper execution of the services for the client.

Lump Sum Fees

13. (a) Fixed lump sum fees shall not be less than those computed on a per diem or percentage rate.

Note. The above Resolution and Report of Committee for the Standardization of Engineering Practices were duly adopted and approved by Ohio Society of Professional Engineers in annual convention assembled in the City of Columbus, Ohio, on the 13th day of February, 1936.

PERRY T. FORD, President
JOHN LAYLIN, Secretary

Resolution adopted by Ohio Society of Professional Engineers in Annual Convention assembled in Columbus, Ohio, February 13, 1936.

Approving and adopting a schedule of minimum fees for engineering services in Ohio.

Whereas, the Committee for the Standardization of Engineering Practices has submitted a schedule of minimum fees for engineering services in Ohio, and

Whereas, Ohio Society of Professional Engineers recognizes a need for a schedule of minimum engineering fees as a part of the standardization of engineering practices in Ohio, and

Whereas, this subject has been under continued and comprehensive study by the Committee for the Standardization of Engineering Practices in Ohio for the past two (2) years, in cooperation with different representative regional groups of Engineers in Ohio, now, therefore,

Be it Resolved, that Ohio Society of Professional Engineers at its fifty-seventh annual meeting at Columbus, Ohio, February 13, 1936, does hereby approve and adopt the schedule of minimum fees for engineering services submitted by the Committee for the Standardization of Engineering Practices in Ohio, and

Be it further Resolved,

(1) That the aforesaid schedule of minimum fees be printed in booklet form (vest pocket size) by Ohio Society of Professional Engineers and be made available to the Society and public at approximate cost, and

(2) That the Committee for the Standardization of Engineering Practices be constituted the Committee of Professional Practices with instructions to continue the study of professional practices including fee and salary schedule for engineers and surveyors.

CUYAHOGA COUNTY

Society Issues Bulletin

The second number of the Cuyahoga County Society of Professional Engineers is an interesting pamphlet which is reproduced as a suggestion for Chapter organizations generally:

Bulletin No. 2, Cuyahoga County Society of Professional Engineers, February 1936, Cleveland, Ohio

Society Affairs

Members are asked to use discretion in giving publicity to any negotiation that is now current. The purpose in this is to avoid interferences that might embarrass or defeat the objectives.

Meetings: The December 20th meeting was attended by 123 members. Considering the near zero weather at that time the turnout was excellent. Mr. Heckman and his committee arranged a very entertaining program.

A March meeting is being arranged. This meeting will be open to the public and upon a current social topic that is of concern to and concerned with engineering. Posteard notice of this meeting will be forthcoming.

Activities: On behalf of the engineers of Cuyahoga County, the Directors and Officers have taken or are taking action as follows:

(a) Federal Housing: Protest has been lodged with the Housing Administration regarding rates of pay for certain engineers on the Cleveland projects.

(b) Board of Education: Engineers activities of the Board of Education have been the subject of conferences with representatives of other engineering organizations. A communication has been addressed to the board on this subject.

(c) Building Permits: The Public Relations Committee, Mr. A. S. Porter, chairman, is gathering data and obtaining legal opinion to determine whether and to what extent it is feasible to restrict issue of building permits to projects evidenced by the plans of registered engineers and architects. The investigation is being made a broad cue and generally applicable.

Results

Discussions with the Civil Service Commission and the Law Department of the City of Cleveland have brought forth the following decision. Beginning February 24th, 1936, applicants for certain engineering examinations must be registered engineers in the State of Ohio. The first examination to be affected by this decision will be held March 13, 1936, and is for the position of "Senior Assistant Mechanical Engineer."

General: The present society program is aimed at four general meetings per year, with bulletins as necessary in between. Committees and Directors are meeting at frequent intervals to carry out Society objectives. It is asked that members with personal problems of professional nature communicate with any Director (see Bulletin No. 1 for names and addresses). Some confidential work of this kind has been undertaken.

Election of Officers: The terms of four Directors end at the Annual Meeting in May. A Nominating Committee, Mr. Bernard L. Green, Chairman, is now making up slates of candidates. The first and preliminary ballot will be mailed out March 12th.

Ohio Society of Professional Engineers

The Ohio Society of Professional Engineers held its 1936 Convention in Columbus, February 11-13. Some 20 members of the Cuyahoga County Society participated. State Society actions of local interest were:

Constitution: A new constitution was adopted and to include provision for the participation and representation of local Societies.

Fees and Salaries: There was adopted and ordered printed a Schedule of Minimum Engineering Fees. This is the first of a series of schedules that have been under discussion for two years and with intent to establish uniform and state-wide practise. Other matters still in committee relate to surveying salaries. Booklet reprints of the adopted schedule will be made available shortly and at cost.

Technical Schools: The Professional Practises Committee of the State Society is charged to meet with representatives from technical schools to establish proper measures for governing private practise by engineering faculty members in competition with engineers in private practise.

Affiliation—State and Local Societies

The Constitution of the Cuyahoga County Society of Professional Engineers provides that the Board of Directors may negotiate a plan of affiliation with the State Society, but the affiliation is subject to letter ballot approval of the membership. A ballot will be mailed out shortly and to provide—if approved—that the Board of Direction shall by formal resolution petition the State Society for affiliations as a local member society. Such affiliation would be on the following terms:

(a) There would be no payments except by local members who voluntarily applied for membership in the State Society.

(b) The Cuyahoga County Society would have a representation on the Board of Direction of the State Society. Such representation would have one vote plus another vote for every 25 members of the Cuyahoga Society who are also members of the State Society.

(c) The Cuyahoga Society would be entitled to the support of the State Society in matters legislative and legal. The State Society contemplates employing legal counsel for this purpose.

This plan of affiliation is the one which was embodied into the State Society Constitution as adopted at the February Convention. The plan has the endorsement of the representatives of several of the local societies. The Board of Direction of the Cuyahoga County Society of Professional Engineers recommends a favorable vote on this plan of affiliation when the ballots are sent out.

Note: Some 40 members of the Cuyahoga County Society of Professional Engineers are also members of the Ohio Society of Professional Engineers. The Board very earnestly recommends others to join and so to enlarge the influence of the Cuyahoga Society in State Society affairs.

Any registered professional engineer or surveyor is eligible for active membership. Those who have applied for but have not yet obtained registration are eligible to Associate Membership. Annual dues in each case are four dollars.

Send letter of application—with $4.00 direct to:

John Laylin, Secretary, Ohio Society of Professional Engineers, Neil House, Columbus, Ohio.

Side Glances

It is interesting to know that the New York State Society of Professional Engineers has in nine years successfully recorded sixty specific accomplishments in their list of objectives. For example: Prosecutions and convictions have been secured under their law. In 1934 they secured the correction of 105 unlawful listings as "Engineers" by unlicensed men in the New York Telephone Directories.

In a recent court case one of our own members was qualified to give "expert testimony" by the fact that he was a registered engineer.

JOHN J. WIRTS, *Secretary.*

OKLAHOMA

Society Incorporation Started

The Oklahoma Society has prepared articles of incorporation and by-laws which are worthy of consideration by other state organizations.

President Shibley and Secretary Lashbrook are arranging for an intensive membership campaign. All professional engineers of Oklahoma are requested to communicate with the officers listed on page four of the American Engineer.

NEWS BULLETIN

Oklahoma Society of Professional Engineers

March, 1936

From Secretary Lashbrook comes the following:

The first annual convention of the Society, held January 25th, was marked by the gathering of over two hundred members in what was probably the largest and most enthusiastic engineering meeting ever held in Oklahoma. At that time the membership was slightly over three hundred. It has now grown to more than three hundred and sixty and additional memberships are being received daily. A mighty fine group picture of those in attendance at the evening banquet which closed the convention, may be obtained from the Secretary at 55 cents postpaid.

Probably the most important actions of the convention were the acceptance of the By-Laws and the decision to affiliate with the National Society of Professional Engineers, so that the engineers of this state may proceed, side by side, with the engineers of the thirty-four other states having engineering registration laws and so that the Society may reap the benefit of direct representation through an active national headquarters at Washington, D. C. The Board of Directors and the Executive Committee are preparing the details of affiliation with the National Society, the appointment of standing committees and the perfection of a system of district chapters, details of which will be announced subsequently. The program is being pushed as rapidly as possible.

An attorney has been retained by the Society to assist the officers and various committees in the work of the Society. While a general legal service to the members cannot be furnished, questions submitted to the Secretary as to interpretation of the registration statute, where of general interest, will be referred to the attorney and answered through subsequent news bulletins. Questions not of general interest will be referred to ap-

propriate committees. A number of questions have been received from those in attendance at the convention and since many of them pertain to the use of the seal, the following general statement has been prepared. While some of the suggested procedure may not, ultimately, prove mandatory, there appear to be no legal inhibitions from the procedure suggested.

Section 22 of the Act apparently contemplates that the registered professional engineer will apply his professional seal to any drawing, print, report, letter, contract or other document or paper to which said engineer is a party in a professional capacity and on which his professional responsibility is indicated by his signature. In considering the application of his seal to a given document, it is suggested that the registrant answer for himself the question: "Is professional engineering responsibility involved?" If the answer is yes, the seal may properly be applied. Letters involving firm quotations, the acceptance of which would result in the completion of contracts, or letters accepting proposals or any other papers which are parts of contracts for the performance of engineering services, are in the same category as above. Purely private or commercial correspondence as differentiated from official professional correspondence does not require the seal.

The statute does not differentiate between engineering work performed by employees of a large organization for use solely within said organization, on the one hand, and engineering work done under any other conditions on the other. Apparently then, it is the intent of the statute that the seal be used by engineers within a large organization in the same manner as it is used by other engineers under other conditions. This generalization is subject to the reservation that the use of the seal is not mandatory on the part of a registered engineer if by virtue of his employment, he is exempted from the provisions of the statute by paragraphs "c" or "d" of Section 17.

In the same connection, we quote herewith from an opinion rendered by the Attorney General of this state to Hon. Chas. M. Pearce, State Health Commissioner, under date of February 14th and replying to an inquiry, in effect, "if it is necessary for the plans relative to water and sewage projects to bear the seal of a licensed engineer." Prefaced by suitable quotations from the statute governing, the following opinion was rendered:

"Since the 1935 Act regulating the practice of professional engineering was enacted for the protection of the public under the police power of the State, and since the drawing up of the plans required to be submitted to your Board under the provisions of Section 6076, supra, is within the definition of 'the practice of professional engineering' within the meaning of Section 2, Article 22, Chapter 24, supra, the Attorney General is of the opinion that said plans must bear the seal of the engineer in order to be official and cognizable by your Board."

It seems reasonable that similar interpretation would apply in any case where any official of a state or local governmental unit is called upon to approve or recognize the plans or specifications prepared by an engineer who is not specifically exempted under the statute and, of course, in this connection, the fact that work was prepared by an exempted subordinate would not eliminate the necessity for the appearance of the seal of the responsible engineer. Since the statute does not differentiate between public and private work, it would follow, by an analogy, that plans or other drawings, including "shop details," the preparation of which involves the application of engineering principles and data, prepared by a fabricating company, a contracting company, an equipment manufacturer or other such organization, for submission to a purchaser or to an engineer or architect in the employ of a purchaser, should bear the seal of the engineer responsible for the preparation thereof.

Copy of the Articles of Incorporation and of the By-Laws of this Society are enclosed for your information.

TEXAS

Submits Constitution

The first draft of the constitution and by-laws to be considered by the Texas Society of Professional Engineers has been prepared as have also similar instruments for County Chapters. Their value as models for other states, as well as their interest for the engineer of the State of Texas, merits reproduction:

PROPOSED CONSTITUTION AND BY-LAWS FOR THE TEXAS STATE SOCIETY OF PROFESSIONAL ENGINEERS, INC.

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CONSTITUTION

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Preamble

CONCERNED with the Public Weal, and

IN ORDER to safeguard life, health, and property, by restricting the practice of Engineering to properly qualified persons;

LIKEWISE, to advance the welfare of the Engineering Profession by the establishment and observance of high ethical standards of conduct, and through sponsorship of the creation and enforcement of adequate license laws and practice acts;

ALSO, to place the control of engineering projects within the scope of such laws and acts;

FURTHER, to focus public attention upon the professional standing, functions, requirements, and accomplishments of engineers;

WITHAL, to sponsor and promote honorable procedure tending toward recognition commensurate with the dignity and responsibility of this profession, THE TEXAS STATE SOCIETY OF PROFESSIONAL ENGINEERS, INC., has been organized; and to such ends the Constitution, of which this preamble is a part, is herewith set forth.

CONSTITUTION

ARTICLE I

Name

Section 1. This Society shall be known as the Texas State Society of Professional Engineers, Inc.

ARTICLE II

Headquarters

Section 1. The Principal office shall be located in such City of not less than fifty thousand population of the State of Texas, as may be selected by a letter ballot, upon recommendation of the Executive Board, and shall be designated as State Headquarters. A two-thirds affirmative vote, with at least twenty percent of the membership voting, shall be necessary so to select.

ARTICLE III

Membership

Section 1. The membership shall consist of Professional Engineers licensed by the State of Texas.

Section 2. There shall be but one class of membership.

Section 3. All membership shall be contingent upon, and simultaneous with, election to membership in a chartered county chapter.

ARTICLE IV

Chapters

Section 1. The Society, through its Executive Board, may authorize and charter one Chapter in each county. Where expedient, two or more counties may be combined for the purpose of the organization of one chapter.

Section 2. The Executive Board of the State Society shall have authority to make rules and regulations for chartering, combining, and/or dissolving chapters.

ARTICLE V

Conduct of Chapters

Section 1. Each chapter chartered by the Society shall adopt such constitution and by-laws for its internal government as it may deem proper; provided, however, nothing therein shall conflict with or contravene the Constitution and By-Laws of the Society.

Section 2. Chapter Constitution, By-Laws, and Codes of Practice, or any amendments thereto, shall not become effective until approved by the Executive Board of the Society.

Section 3. Chapters shall engage in such activities as are consistent with professional ideals and ethics and are conducive to public welfare. Such activities shall be restricted to the county or counties for which the chapter is chartered, except as the Executive Board may authorize.

Section 4. Chapters shall collect, from their respective memberships, all dues and assessments payable to the State Society; and, in addition, may fix and collect such chapter dues as they shall determine necessary for their chapter activities and administration, as provided in chapter constitution and/or by-laws.

Section 5. It shall be the duty of each chapter to transmit to State Headquarters or to the Society's duly designated officer the following: All State Society dues, within fifteen days after their receipt; the names and addresses of newly elected, expelled, suspended, or deceased members, at once; and the notices of all meetings and elections.

Section 6. A Chapter intending to present a resolution for a vote at any meeting of the State Society, shall mail copies of such resolution to all other chapters and to State Headquarters, with a synopsis of the subject, at least three weeks

prior to the meeting; or to the Resolutions Committee and to State Headquarters at least four weeks prior to the meeting.

Section 7. Authority to reprimand members, to suspend from membership temporarily, to expel from membership shall be vested in the several chapters; provided, however, that in expulsion cases action shall be after approval by the Executive Board of the State Society. Chapters may conduct investigations, hearings, and trials, review of which shall be as provided in the By-Laws.

Article VI

Officers, Directors, and Executive Board

Section 1. The officers of the State Society shall consist of a President, a First Vice-President, a Second Vice-President, an Executive Secretary, a Financial Secretary, and a Treasurer.

Section 2. There shall be twenty-four Directors, representing, as far as practicable, all sections of the State.

Section 3. The Officers and Directors, together with the two immediate Past Presidents, shall form the Executive Board of the Society. The President of the Society shall be Chairman of the Executive Board.

Article VII

Committees

Section 1. There shall be seven standing Committees; namley, Ethics and Practice, Legislative and Enforcement, Public Relations, Membership, Chapter Activities, Rules, and Resolutions.

Section 2. The Executive Board shall determine the number of which each standing committees shall be composed.

Section 3. The chairman and members of standing committees shall be appointed by the President for a period of one year or until discharged, and shall be designated within one month after the election of the President.

Section 4. A Nominating Committee of five members shall, at the Winter Meeting, be nominated and elected from the floor. No Officer or Director shall be eligible for membership on this committee.

Section 5. An Audit Committee of three members shall, each year, be appointed by the President during the month of January.

Section 6. Special Committees shall be appointed by the President as required. He shall determine the size thereof and shall name the chairmen.

Article VIII

Dues

Section 1. Dues shall be as provided in the By-Laws and shall be collected by the county chapters.

Article IX

Good Standing

Section 1. The Executive Board of the State Society shall have the authority to promulgate rules and conditions of good standing. Unless the Executive Board rules otherwise, a member shall not lose good standing, for non-payment of dues, until he is in arrears for more than two years.

Article X

Codes

Section 1. The Code of Ethics adopted by the Society upon recommendation of the Executive Board, and any amendments thereto, shall be binding on all chapters. Amendments to the Code of Ethics shall follow the same procedure as provided in Article XIII for amendments to this Constitution.

Section 2. The several chapters shall adopt Codes of Practice suitable to the districts for which their charters have been granted.

Article XI

Elections

Section 1. All Officers shall be elected annually and shall hold office for one year or until their successors are chosen. Eight Directors shall be elected each year for a term of three years.

Section 2. All elections shall be by letter ballot. Ballots shall be mailed at east two weeks prior to the date of the meeting at which the election is to be held.

Section 3. A plurality of all votes cast by ballot shall be necessary to elect to any office.

Section 4. Upon the death, resignation, or removal of any Officer or Director, the Executive Board may fill the vacancy until the next annual election.

Article XII

Votes

Section 1. Votes, except those required to be by letter ballot, at all regular and special meetings of the Society, shall be by delegate.

Section 2. Each Chapter shall be entitled to one vote, plus one additional vote for each five members, in good standing, as reported by the Financial Secretary of the State Society, for the fiscal year preceding that in which the meeting, at which the vote is taken, is convened.

Section 3. Credentials of a delegate shall consist of a letter addressed to the Executive Secretary of the Society over the signature of the Chapter Secretary, stating that such designated Professional Engineer shall be accorded the right to register that Chapter's vote in whole, in part, or split, on any question voted upon. Such credentials shall be presented, in person, to the Chair.

Section 4. Chapters may delegate a member of the State Society who is a member of a chapter other than that delegating him, but no delegate shall cast the votes of more than two chapters.

Section 5. Chapters may send as many delegates as they desire but each shall have proper credentials which shall state what proportion of the Chapter's vote each is empowered to cast.

Section 6. The Chair shall determine and rule upon the validity of delegate's credentials except that when objection is made as to the propriety of any credential a two-thirds majority of the delegate votes, not in question, shall be required to seat the delegate.

Section 7. A roll call of Chapter delegates may, on any question, be dispensed with if no delegate raises objection.

Section 8. When a roll call is necessary the secretary of the meeting shall tally the vote and announce "ayes" and "nays" before the Chair declares the success or failure of the question.

Article XIII

Amendments

Section 1. This Constitution may be amended by letter ballot provided, however, that such amendment shall have been presented to the Executive Board in writing and that, a majority of the Executive Board having approved of the amendment, it shall have been submitted to the Society for decision at least two weeks prior to the date set for the closing of ballots. A two-thirds affirmative vote, with not less than twenty percent of the membership voting, shall be required to amend this Constitution or any part thereof.

Section 2. When a proposed amendment is presented to the Executive Secretary in writing and signed by ten percent of the membership in good standing, approval of the Executive Board shall be unnecessary before submission to the Society, in accordance with Section 1 of this Article.

Section 3. Amendments to this Constitution shall become effective immediately upon approval as provided in Section 1 of this Article.

BY-LAWS

Article I, Fiscal Year; Article II, Meetings; Article III, Officers; Article IV, Executive Board; Article V, Committees; Article VI, Dues and Assessments; Article VII, Obligations; Article VIII, Amendments.

BY-LAWS

Article I

Fiscal Year

Section 1. The Fiscal Year of the Society shall be from January first to December thirty-first.

Article II

Meetings

Section 1. REGULAR. The Society shall regularly convene three times annually at the call of the President. Such meetings shall take place as follows: Once during the winter season, once during the spring season, and once during the autumn season. The location and date of these meetings shall be determined by the Executive Board.

Section 2. SPECIAL. Special meetings shall be called by the President at the request of the Executive Board, or upon the written request of twenty-five members, or may be called upon his own volition. The purpose of such meetings shall be set forth in the notice to members; and no business, other than that for which the meeting was called, shall be transacted.

Section 3. ANNUAL CONVENTION. The spring meeting shall be known as the Annual Convention.

Section 4. QUORUM. For the purpose of transacting the business of the Society, a quorum shall consist of delegates, properly accredited, representing at least one-third of the chartered county chapters.

Section 5. RESOLUTIONS. At any meeting of the Society all resolutions shall be presented by the Resolutions Committee and shall not be in order unless a copy shall have been mailed to each county chapter, and to State Headquarters, at least three weeks prior to the meeting; provided, however, that matters presented less than three weeks prior to the meeting may be considered and acted upon with the specific consent of three-fourths of the delegate votes present.

Section 6. ORDER OF BUSINESS. The order of business for regular meetings shall be:

1. Presentation and Acceptance of Delegate Credentials. 2. Reading of Minutes. 3. Reading of Communications. 4. Financial Report. 5. Reports of Com-

mittees. 6. Unfinished Business. 7. New Business. 8. Adjournment.

The order of business for the Annual Convention shall be:

1. Presentation and Acceptance of Delegate Credentials. 2. Roll Call of Officers. 3. Reading of Minutes. 4. Reading of Communications. 5. Reports of Officers. 6. Reports of Committees. 7. Unfinished Business. 8. Election of Officers. 9. Installation of Officers. 10. New Business. 11. Adjournment.

Article III

Officers

Section 1. PRESIDENT. It shall be the duty of the President to preside at all meetings of the Society and of the Executive Board. He shall be, ex-officio, a member of all committees, with the sole exception of the nominating committee. He shall, subject to the Executive Board, have general direction of the business of the Society.

Section 2. VICE-PRESIDENTS. In the absence of the President or in case of his inability to act, it shall be the duty of the Vice-Presidents, in order of precedence, to perform all the duties of the President.

Section 3. EXECUTIVE SECRETARY. The Executive Secretary shall keep an accurate record of proceedings of the Society, of its membership and of the licensees of the State; shall conduct correspondence; and shall have custody of all official papers and records, subject to direction of the Executive Board. He shall report quarterly to the Executive Board. In the absence of the President and Vice-Presidents, he shall call the meeting to order and call for a motion for the election of a President, pro tempore. He shall issue all calls and notices ordered by the President or the Executive Board. He shall have such other duties and prerogatives as the Executive Board may assign to him. At the Annual Convention he shall submit a written report covering the duties and activities of his office including a statement of the membership of the Society. He shall receive such salary and shall have such assistants as the Executive Board may determine. At the expiration of his incumbency he shall turn over to his successor or to the Executive Board all books, documents, and other property of the Society in his custody, receiving a receipt therefor.

Section 4. FINANCIAL SECRETARY. It shall be the duty of the Financial Secretary to keep a correct account with each and every chapter of the Society. He shall pay to the Treasurer, at least every two weeks, all monies collected, and the Treasurer's receipt shall be his voucher therefor. During the first week in January the Financial Secretary shall report to State Headquarters, to the Executive Board and to the several county chapters, the number of delegate votes to which each chapter is entitled under Article XII, Section 2 of the Constitution. He shall render quarterly reports to the Executive Board of the receipts of the preceding quarter and of the amounts outstanding, and such other information as may be required. His books shall be open for examination at such times as the Society, the President, or the Executive Board may request. He shall receive such salary and shall give such bond to secure the faithful discharge of his duties, as may be determined from time to time by the Executive Board. The fee for such bond shall be paid out of the treasury of the Society. At the expiration of his term of office he shall turn over to his successor, or to the Executive Board, all books, papers, and money belonging to the Society, taking a receipt therefor.

Section 5. TREASURER. It shall be the duty of the Treasurer to receive and disburse all monies and keep the records of accounts of the Society, making a quarterly report of the receipts and disbursements to the Executive Board and an annual report to the Society, at the Annual Convention. He shall receive such salary and shall give such bond to secure the faithful discharge of his duties, as may be determined from time to time by the Executive Board. The fee for this bond shall be paid out of the treasury of the Society. At the expiration of his term of office he shall turn over to his successor, or to the Executive Board, all books, papers, and money belonging to the Society, taking a receipt therefor.

Article IV

Executive Board

Section 1. The Executive Board shall have general supervision of all matters pertaining to the Society. Nine members of the Executive Board shall constitute a quorum. Between regular meetings it shall have the power to act for the Society whenever an emergency arises.

Article V

Committees

Section 1. ETHICS AND PRACTICE. The Ethics and Practice Committee shall formulate and define codes of ethics and practice for the guidance of the profession, shall pass upon complaints relating thereto, and shall devise ways and means for the enforcement of such codes. It shall have authority to supervise proceedings and make recommendation to the Executive Board in connection with the ethics and practice activities of chapters. It shall also have authority to review investigations, hearings, and trials conducted by chapters in connection with matters pertaining to ethics and practice and also those of a grievance nature. Its findings and recommendations shall not impose any obligation upon a chapter except in cases where the actions of a chapter have not been in conformity with the Constitution, By-Laws, or Codes of the Society, and then only upon approval by the Executive Board. Its findings shall be transmitted to the Executive Board for consideration and action.

Section 2. LEGISLATIVE AND ENFORCEMENT. The Legislative and Enforcement Committee shall have jurisdiction over all matters relevant to legislation, law enforcement, and legal protection of the rights and interests of the Society and of the individual members. Its reports shall be transmitted to the Executive Board for consideration and action, unless otherwise empowered.

Section 3. PUBLIC RELATIONS. The Public Relations Committee shall serve as a contact committee between the Society and the general public, the press, other engineering societies, civic associations, and other groups. Matters arising outside of the Society or its chapters, requiring committee study before action, shall be referred to it. Its reports shall be made to the Executive Board for consideration and action.

Section 4. MEMBERSHIP. The Membership Committee shall investigate and report, with recommendations, upon all petitions for the formation of chapters. It shall at all times seek to expand the membership and shall have the authority to make recommendations to, and to supervise, the membership activities of chapters. It shall report to the Executive Board.

Section 5. CHAPTER ACTIVITIES. The Chapter Activities Committee shall encourage and assist the chapters in the arrangement and accomplishment of activities which will redound to the benefit of the Chapter, the Society, and the Community. It shall report to the Executive Board.

Section 6. RULES. The Rules Committee shall record and preserve all rules, regulations and procedure voted by the Executive Board, or by the Society. Matters arising relevant to policy, management, or constitutional questions, which require committee study shall be referred to it. It shall report to the Executive Board.

Section 7. RESOLUTIONS. The Resolutions Committee shall receive from any chapter or chapters or from a member or members of the Society resolutions to be presented at a meeting of the Society. These it shall edit, or redraft if necessary, subject to the approval of the makers; and shall forward a copy to each county chapter and to State Headquarters at least three weeks prior to the meeting. It shall also present resolutions by "specific consent," in accordance with Article II, Section 5 of these By-Laws.

Section 8. NOMINATING COMMITTEE. This Committee shall elect its own chairman and shall have its report in the hands of the Executive Secretary five weeks prior to the day on which the Annual Convention is to be held. Nominations, other than those of the Committee, shall be in order at all times and, if supported by a written request of fifteen percent of the membership, shall be printed on the official ballot.

Section 9. AUDIT COMMITTEE. This Committee shall report at the Annual Convention on the condition of the books and records, of the Executive Secretary, of the Financial Secretary, and of the Treasurer. The period covered by this report shall be the previous fiscal year.

Section 10. SPECIAL COMMITTEES. These Committees shall meet at the earliest possible date after appointment, study their special assignment thoroughly, and report promptly.

Section 11. QUORUM. A majority of any committee shall constitute a quorum thereof.

Article VI

Dues and Assessments

Section 1. DUES. The dues of the Society shall be seven dollars per annum, due and payable at the beginning of the fiscal year. Members elected, or reinstated, during the fiscal year shall pay proportionate dues referred to the previous quarter year.

Section 2. APPORTIONMENT OF DUES. The dues of the State Society shall be apportioned as follows: three dollars shall be retained by the State Society for its own activities and four dollars shall be forwarded to the National Society. Of this four dollars, three shall be credited to the member as Na-

tional Society dues and one dollar as a subscription fee for the magazine.

Section 3. ASSESSMENTS. Assessments shall be entirely discretionary with the membership, shall be voted upon by letter ballot, and shall be considered only upon written recommendation of the Executive Board or of twenty-five members. The details of such assessments shall be determined at the time the matter is presented for consideration, and shall be set forth in the letter ballot. A two-thirds affirmative vote, with at least twenty percent of the membership voting, shall be necessary to authorize levying of the assessment.

ARTICLE VII

Obligations

Section 1. HOW INCURRED. No obligation, except incidental expenses, shall be incurred and no continuing obligations entered into without a two-thirds affirmative vote at a meeting of the Society or of the Executive Board.

Section 2. HOW PAID. The payment of all obligations shall be approved by the Executive Board, and all checks and vouchers shall be signed jointly by the President and the Treasurer.

ARTICLE VIII

Amendments

Section 1. These By-Laws may be amended by the delegates at any meeting, provided that such amendment shall have been approved by the Executive Board. The Executive Secretary shall, upon such approval, mail copies of the proposed amendment to the President and Secretary of each Chapter, at least one month prior to the meeting at which the amendment is to be voted upon. A two-thirds affirmative vote of the delegates voting shall be required to amend these By-Laws or any part thereof. A particular section of these By-Laws may be suspended, by unanimous consent of the delegates present at any meeting, for a single stated purpose.

Section 2. When a proposed amendment is presented to the Executive Secretary in writing and signed by twenty-five members in good standing, submission by the Executive Secretary to the County Chapters, without approval of the Executive Board, shall be mandatory.

Section 3. Upon the attainment of a two-thirds majority at any meeting, any amendment to these By-Laws shall become effective immediately.

Engineers of Texas are urged to communicate with Engr. J. W. Beretta of 1203 National Bank of Commerce Bldg., San Antonio, and Engr. Max P. Von Hoeneyer of Austin, % Texas State Highway Department, who is Temporary Chairman of the Texas Society.

EUROPE CORRESPONDS

(*Continued from page* 14)

structural engineering in reinforced concrete. (a) Walled structures. (b) Wide-span bridges.

5) (a) Theory and research work on details of steel structures of welded and riveted construction. (b) Application of steel in bridge construction. (c) Application of steel in hydraulic construction.

6) Concrete and reinforced concrete in hydraulic engineering (Dams, Pipe lines, pressure galleries, etc.)

7) Research concerning building ground.

The various reports of the Congress will be published in the three official languages (German, English and French) in separate volumes; moreover a special telephone installation will be provided for, allowing the participants in the Congress to follow the Congress work in each of the three Congress languages.

Besides the technical and scientifical work the Committee of Organization in Berlin (President Dr. Todt, General Inspector for German Roads) will organize several excursions and visits to important structural works. The official closing meeting of the Congress will take place in Munich on October 10th, 1936. The Secretariat of the International Association for Bridge and Structural Engineering, Swiss Federal Institute of Technology in Zurich, will give any information desired on this matter.

Zurich, February 1936.

AMERICAN MEDICAL ASSOCIATION

Has Over 100,000 *Members*

The most respected and influential professional group in America is generally conceded to be the American Medical Association.

This organization, like the National Society of Professional Engineers, is a confederation of state and territorial societies. It has fifty-four such constituent bodies with more than 2000 county medical groups. Is it any wonder that such an association commands attention and respect. No engineering society today can claim one-fifth the numerical strength of the American Medical Association and aside from the National Society of Professional Engineers none of them possesses any potential value as a spokesman for the profession. Doctors know better than to divide their profession. Engineers must learn that in consolidation only can they vie with law and medicine in directing public opinion.

HARVARD ANNOUNCEMENT

New Traffic Control Fellowship

The following letter and accompanying bulletin have been received from Harvard University and reproduced in the belief that the same may afford an opportunity to interested engineers.

Dear Sir:

The Bureau for Street Traffic Research in Harvard University is pleased to announce, in accordance with the conditions contained in the attached folder, the availability of fifteen graduate fellowships in the field of street and highway traffic control and administration.

This Bureau was organized in 1925 for the purpose of providing basic research in connection with traffic accidents and congestion and for the training of men in the technical and administrative problem of traffic regulation. Former students of the Bureau now hold many important positions.

The current expansion of the training activities of this Bureau has been made possible through grants to Harvard University by the Automobile Manufacturers Association.

We seek your cooperation in selecting the personnel for this training course. May we ask that you be good enough to bring the attached announcement to the attention of those who might be interested in an appointment to one of these fellowships. Furthermore, we would like your assistance in advising us as to the ability of such men as may apply.

In addition to sound training, the men should have such character and personality as would make them likely to succeed in positions requiring cooperative effort and administrative ability.

Additional copies of the printed announcement will be sent upon request.

Thanking you for your assistance, I am

Sincerely yours,

MILLER MCCLINTOCK.

Harvard University, Bureau for Street Traffic Research — Announcement of Street and Highway Traffic Control Fellowships and two graduate courses: The Principles of Street and Highway Traffic Control and The Problems of Street and Highway Traffic Control. Beginning September 28, 1936.

Fellowships and Courses for 1936-37

The Bureau for Street Traffic Research of Harvard University announces the availability, beginning September 28, 1936, of fifteen graduate fellowships, each carrying a stipend of $1200 and an additional amount not exceeding $200 for travel and field investigation. The regular annual fee of $400 for tuition will be deducted from the fellowship.

These fellowships have been made available through a gift to the University by the Automobile Manufacturers' Association. They are designed to make possible a year's intensive training in the principles and problems of street and highway traffic control. Students who are awarded these fellowships will be required to take two full courses in Street and Highway Traffic Control as well as two approved collateral courses.

Officers of Instruction

Miller McClintock, Lecturer on Government, Director of the Bureau for Street Traffic Research, and Director of the Bureau of Municipal Research.

Maxwell Halsey, Assistant Director of the Bureau for Street Traffic Research. Formerly Fellow in the Bureau for Street Traffic Research and Traffic Engineer for the Commonwealth of Massachusetts.

Visiting Lecturers. These will be obtained from the ranks of those prominent in the field of street and highway traffic control.

RENDERING SERVICE

(*Continued from page* 14)

public should be satisfied with no less.

Mr. Hopkins thinks that regulation would not raise the standards. The reverse would seem to be more in order, for regulation in both the medical and legal professions has been beneficial.

Under state law requiring qualified operators under the supervision of a licensed professional engineer, the public needs would be much more satisfactorily met than by an educational program alone, which it seems would be not only ineffective but impractical.

HAROLD R. TOWSE,
Rockville Center, L. I.

Would that more engineers were as professionally minded and as forceful in expression as Mr. Towse.

SOCIETY BULLETINS

Registration Legislation
and
P.W.A. Opportunities

Legislation providing for the registration of engineers has been introduced into Congress by Representative James L. Quinn of Pennsylvania. The measure which is patterned after the suggested

Model Uniform Law has been referred to the Committee on the District of Columbia, and ordered printed.

Each State Society has received from Secretary Conlon a list of the members of the said Committee.

In connection with the proposed legislation the following bulletin has been issued by the Secretary of the National Society:

Subject—Engineering Registration, District of Columbia.

To All State Secretaries:

Congress has received a Bill (H. R. 11853—Quinn—Penna.) proposing to enact an Engineering Registration Law in the District of Columbia. Please have your members address their respective representatives advising them of the merits of this progressive legislation and soliciting their favorable consideration. A telegram or letter will be appreciated by the District of Columbia Society of Professional Engineers and all other engineers in the District of Columbia who will eventually affiliate with the Society.

Sincerely yours,
WILLARD S. CONLON,
Secretary N. S. P. E.

GOOD NEWS FOR ENGINEERS

An interesting comment on opportunities for engineers is contained in the following:

To All State Secretaries:

P.W.A. has defined the Owner's obligation relative to furnishing supervision and inspection on projects as follows:

The Owner is a party to a contract with the Public Works Administration. The Public Works Administration finances the project in whole or in part, and has an interest in the project until completion and acceptance by the Owner. This interest is protected by constructing the project in strict accordance with the approval plans and specifications and the construction contract. It is not sufficient that plans and specifications be approved and a contract let. The Owner is responsible for assuring itself and the Public Works Administration that compliance with these construction documents is obtained.

Since the presence of a representative of the Inspection Division, P.W.A. does not in any way relieve the Owner of the necessity for obtaining compliance with a properly executed construction contract, the owner is therefore under the obligation to make certain that the project is constructed in the required manner. This can be done only by providing adequate and competent supervision of the project. The Public Works Administration cannot assume this responsibility since its contract is with the owner, not the contractor.

State Engineer Inspectors shall therefore require Owners to provide such supervision and inspection as is necessary to protect their interest and that of the Public Works Administration.

The State Societies of Professional Engineers should contact the P.W.A. State Engineer Inspectors and the Owner's to the end that adequate and competent supervision is furnished by Registered Professional Engineers.

Sincerely yours,
WILLARD S. CONLON,
Secretary N. S. P. E.

THE CONTRACT SYSTEM

(*Continued from page* 13)

same degree of responsibility for making profits they would feel if working for a private contractor. They felt that the funds were unlimited and that there was no need for economy. He found that it was impossible to secure, from the Superintendent down to the common laborer, that same degree of cooperation, loyalty and eagerness to perform which must be and always is instilled in the minds of any successful contractor's organization."

Every contractor or Superintendent knows that there is no incentive for a man sitting upon a Government drag line machine, for example, to pull his bucket back in that fraction of a minute faster which spells the difference between profit and loss to a contractor. Back of the man on the Government machine is the Supervising Engineer. Back of the engineer is a great intangible Government of immense wealth. Back of the man on the *contractor's machine* is the contractor himself who perhaps has fought his way up from the same seat. He is familiar with every movement of the machine, and he knows that every movement means either a profit or a loss to him. No matter how earnest or ambitious the Supervising Engineer may be, he cannot secure the same efficient work as can the contractor.

The ambitious capable leader type of man cannot be expected to be found on the Government payrolls, because that type always gravitates to where the rewards are greatest. The Government cannot set up a system of proper and quickly paid rewards. The contractor can and does, and therefore, always gets the right man for the job. It is an open secret that private employers seldom offer responsible positions to men who have been long in Government service for they do not feel that they can obtain the same efficiency from them as from men who have been employed in private work.

That intangible quality of leadership which is so essential to the successful completion of construction projects, so necessary for producing profits, for keeping down costs and for overcoming apparently insurmountable obstacles is a rare quality indeed. Not more than two or three percent of the men who engage in construction work have this quality. It may be that it is not necessarily an inborn quality and that it can be developed, but it is quite unlikely that it will ever be developed in the atmosphere of the Day Labor Method.

When you take an engineer, for example, away from the job for which he is excellently trained and put him at the highly specialized work of directing, coordinating and co-relating work, which is the job of the contractor, you cannot expect the same results you expect from the man who is highly trained for such work. Frequently the engineer does not have the proper training for such work. Such training can be had only through the same school of experience through which the contractor has been trained. The engineer is actually handicapped by the training he has received as an engineer, because the training of an engineer calls for a point of view and character of action diametrically opposed to that required of the contractor. It has been said that all men may be classified as either *defeatists, debators* or *doers*. The engineer of ability is necessarily trained as a debator, whereas the contractor is trained as a doer, and everybody knows that the execution of a construction project calls for the services of one real *doer* for each project.

(*To be concluded in April issue*)

AN ENGINEER'S REFLECTIONS

(*Continued from page* 11)

all kinds of knowledge and therefore necessitates selection of men of numerous callings and close association with them."

The highly mechanized social order which we have had such a prominent part in creating is like a colossal complicated machine, set in motion without guidance or control, because in our anxiety to create we have neglected the all important problem of control and direction. In this our profession has failed miserably, yet it remains our responsibility. The creator of a complicated mechanism must also teach others in its use and application, else it is likely to be of small value and possibly of great harm. Just so our highly mechanized social order is dependent upon us for guidance and direction.

This society of Professional Engineers can be a powerful influence in the development of men and means for using the creature of our imagination to the everlasting benefit of ourselves and posterity, if we will but assume the responsibility commensurate with the attributes of our profession.

In this connection let me call your attention that our professional standing is of our own making. If we permit men to classify themselves as "Decorating Engineers," "Welding Engineers," etc. it is our fault. They do this because the word Engineer, in their minds, elevates their trade. Again if we permit pseudo engineers, power plant operators, locomotive operators, or survey men to use the title of engineer, we can expect that the public conception of an engineer will conform to that status which is most commonplace. These conditions call for a cleansing from within. This organization is in a key position to accomplish just such rehabilitation and I am glad to be able to be party to the effort.

Apropos of the professional engineers' viewpoint with respect to his works I want to quote from the works of Ruskin:

"Therefore, when we build, let us think that we build forever. Let it not be for present delight nor for present use alone, let it be such work as our descendants will thank us for, and let us think as we lay stone on stone, that a time is to come when those stones will be held sacred, because our hands have touched them, and that men will say as they look upon the labor and the wrought substance of them, "SEE! this our fathers did for us."

Can we not follow this tenet in the strengthening of our professional standing?

I cannot help bringing before you two problems in which we are concerned, for the benefit of our social structure. The first of these is that of regional planning as the basis of water supply and sanitary treatment for related community development within a natural drainage basis. Correlated development along these lines has been initiated by individuals, in some few instances, and has had the approval of governmental bodies having the jurisdiction of approval only. I think that

the technological development of a region in these matters should be prescribed in broad terms by such an organization as the United States Engineer Department or its equivalent. The second which in a large measure is an engineering problem, is that of housing for the low income group of our population. It is my opinion, that until we have discovered means of providing safe adequate housing for this group our social welfare bill will continue to increase. Of course other things such as finance and wages are a part of this matter, but in the final analysis it is an engineering problem of wide scope toward which we should bend our thought and energy. Time does not permit of developing these problems in any detail, but it is hoped that the members of this society will react to these matters in a manner that will show that we can be worthy fathers to the creatures of our genius.

Finally, the private and public recognition of our profession should be based upon our intrinsic worth as engineers. Only through personal devotion to our profession can its standing be founded on the firm base it deserves. The "Engineers' Creed" by Thomas J. Van Alstyne typifies to me the ideals toward which we as members of our profession should strive. It is:

"To respect my country, my profession, and myself to be honest and fair with my fellow men, as I expect them to be with me, to be a loyal citizen of the United States, to speak of it with praise and act always as a trustworthy custodian of its good name, to be a man whose name carries prestige with it wherever it goes, to base my expectations of a reward on a solid foundation of service rendered, to be willing to pay the price of success in honest effort, to look upon my work as an opportunity to be seized with joy and to be made the most of, not as a painful drudgery to be reluctantly endured, to remember that success lies within my own self and in my own brain, my own ambition, and my own courage and determination, to expect difficulties and force my way thru them to turn hard experience into capital for future struggles, to believe in, my profession, heart and soul, to carry an air of optimism in the presence of those I meet to dispel all temper with cheerfulness, kill doubt with strong conviction, and reduce friction with an agreeable personality, to make a study of my business to know my profession in every detail, to mix brains with effort and system, in my work, to find time to do every needful thing by not letting time find me doing nothing to hoard days as a miser does dollars, to make every hour bring me dividends in increased knowledge and healthful recreation. To keep my future unincumbered with debts, to save as well as to earn. To curtail expensive amusements until I can afford them to steer clear of dissipation, and guard my health of body and peace of mind as a most precious stock, in trade. Finally to take a good grip on the joy of life to play the game like a man to fight against nothing as hard as my own weakness, and endeavor to give it strength. To be a gentleman and a Christian in practice that I may be courteous to man, faithful to friend and true to God."

INTERSTATE PRACTICE

(*Continued from page* 10)

ing the amount of State fees and other registration requirements.

Subsequent Applications for Reciprocal Registration

14. *The original Council record is kept on file* in the office of the Secretary of the Council. Whenever an applicant wishes to apply for registration in additional States, it is only necessary to advise the Council the name of the State in which application is to be made and enclose the Council's fee of $10.00 to cover the expense of duplicating and transmitting the applicant's record to the registration board in that State. As in the case of first applications for reciprocal registration, the applicant will be furnished the proper State application blank and will be notified as to the amount of the State fee to be paid.

If a long period of time has elapsed between the original investigation and the subsequent application for reciprocal registration, the Council will make further investigation to ascertain whether the applicant has maintained the professional standard indicated by the original record, and the applicant may be requested to furnish additional architect and client references.

Standard N.C.A.R.B. Examinations

15. *In order to establish a basis of architectural qualification which can be accepted*, without question, by all States as equal to their own requirements, the National Council of Architectural Registration Boards has devised a voluntary examination, known as the Standard N.C.A.R.B. Examination, which is as near to a national examination as is possible in the United States. Since professional registration of its citizens is regulated by each State, no person may be required to take an examination which exceeds the requirements for his particular trade or profession in his own State. However, should an architect desire to meet the requirements for registration in any or all states, he has the privilege of voluntarily applying for and, in case he is found eligible, of taking a Standard N.C.A.R.B. Junior Examination, or a Standard N.C.A.R.B. Senior Examination, depending upon his classification. The passing of such an examination gives an architect high professional rating and carries the recommendation of the National Council that he be granted registration in any State to which he may apply without either personal appearance or further examination.

A Council record is a necessary preliminary to the taking of a Standard N.C.A.R.B. Examination, either Junior or Senior, but not every architect who has a Council record is eligible to take such an examination. For illustration, only college graduates who have had three years of practical training in an architect's office are eligible to take a Standard N.C.A.R.B. Junior Examination.

The Standard N.C.A.R.B. Examinations are described in detail in Council Circular of Advice No. 3.

SCIENCE AND REALITY

(*Continued from page* 8)

we had a single comprehensive mathematical system of the universe, but as was said before, we have two complementary systems. A ray of light travels between two stars moving with respect to one another. Nature does not say: I have to be mindful of the theory of relativity; I shall keep the velocity of light constant and do some juggling with time so that that astronomer on yonder ball of earth will get that velocity as a constant. It is we who do the juggling with time for the purpose of putting sense into a mathematical formula which has the velocity of light involved, which velocity happens to come out the same in two different directions in a certain experiment. But what is nature itself doing? We cannot tell. There is, for example, a train of ultra violet nebulosities on its way toward a piece of metal. Nature does not say: "There is such and such a number of you nebulosities; in that piece of metal there is such and such a number of cloudinesses with condensations which represent the most probable locations of electrons—by the theory of probability you are bound to knock out so and so many of those condensations—go ahead and crowd into that piece of metal the best way you can." This is the way we think of it, but it is not nature's way. Well, what does nature do? We cannot tell. We only assume that whatever nature does with the velocity of that light between the two stars is not inconsistent with whatever it does when the nebulosities hit the cloudinesses; we assume that there is a uniform scheme underlying all phenomena. Until such time as this scheme is detected we are disinclined to take too literally the PICTURES which the mathematical formulas would warrant. All that we are willing to concede is: from this mathematical formula it looks *as if* that yellow blotch was gathering up into an egg, *as if* these light quanta and electrons acted according to the law of probability, or, for that matter, *as if* the electrons had a little will of their own. All in all, we are willing to concede a world of "as if's."

We have a hunch that nature intends us to look at her with a certain amount of superficiality; that science shall consist of two complementary paths toward an unknown goal. Those cloudinesses seem to say: Procul este profani!—Stay away, uninitiated!

WHAT IS WRONG WITH THE ENGINEERING PROFESSION?

(*Continued from page* 5)

neering Society," but is truly a "Society of Engineers." It is not a technical Society, but a professional society. It is an organization of, by, and for the Engineering Profession, and is the only organization in which membership is limited to those who have been legally qualified and admitted to practice in the Engineering Profession.

We have ninety national technical organizations but only one national professional society—the National Society of Professional Engineers. It is an organization uniting Engineers (and only Engineers) of all sections of the country and of all branches of the profession in a truly professional program. It is dedicated to the integration of the engineering profession and to the advancement of the profession in public service and in public esteem.

(Further articles in this series by Engr. D. B. Steinman will appear in succeeding issues).

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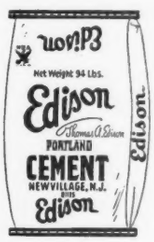

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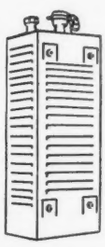

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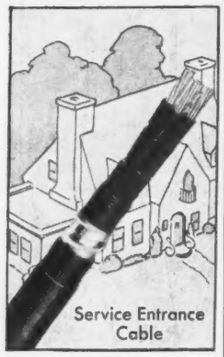
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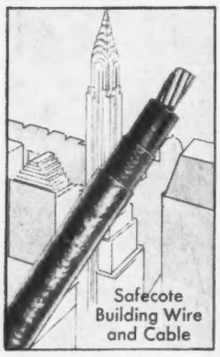
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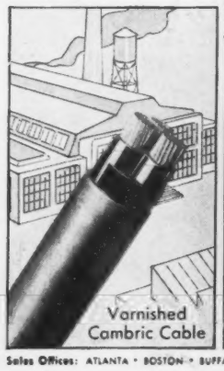
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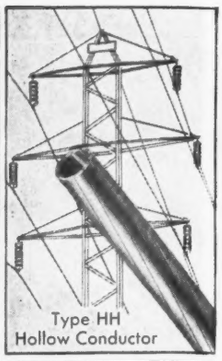
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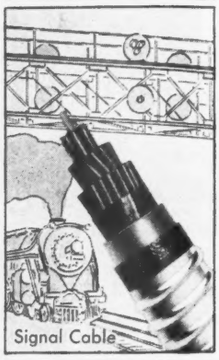
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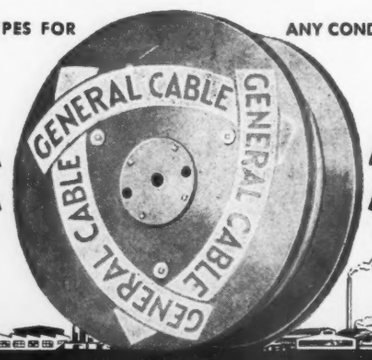

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